This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.01 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The VPDES Permit also has an additional design flow tier of 0.02 MGD. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	Fauquier Springs Country Club Wastewater Treatment Plant P. O. Box 419 Warrenton, VA 20186	SIC Code :	4952 WWTP
	Facility Location:	9236 Tournament Drive Warrenton, VA 20186	County:	Fauquier
	Facility Contact Name:	Donald Hearl	Telephone Number:	540-825-6660
	Facility E-mail Address:	donh@ess-services.com		
2.	Permit No.:	VA0077411	Expiration Date of previous permit:	December 21, 2013
	Other VPDES Permits associated with this facility:		None	
	Other Permits associated with this facility:		None	
	E2/E3/E4 Status:	NA		
3.	Owner Name:	Sulphur Springs Investment Corporation		
	Owner Contact/Title:	Robert Foley/President	Telephone Number:	540-347-2500
	Owner E-mail Address:	ljfoley1@comcast.net		
4.	Application Complete Date:	July 26, 2013		
	Permit Drafted By:	Joan C. Crowther	Date Drafted:	1/14/14
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	1/30/14
	Public Comment Period :	Start Date: 2/12/14	End Date:	3/14/14

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name :	Rappahannock River	Stream Code:	3-RPP
Drainage Area at Outfall:	205.7 sq.mi.	River Mile:	158.41
Stream Basin:	Rappahannock River	Subbasin:	None
Section:	3	Stream Class:	III
Special Standards:	None	Waterbody ID:	VAN-E02R
7Q10 Flow:	1.68 MGD	7Q10 High Flow:	21.3 MGD
1Q10 Flow:	1.42 MGD	1Q10 High Flow:	16.8 MGD
30Q10 Flow:	3.6 MGD	30Q10 High Flow:	30.4 MGD
Harmonic Mean Flow:	25.2 MGD	30Q5 Flow:	6.2 MGD

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law	___	EPA Guidelines
X	Clean Water Act	X	Water Quality Standards
X	VPDES Permit Regulation	___	Other
X	EPA NPDES Regulation		

7. Licensed Operator Requirements: Class IV

8. Reliability Class: Class II

9. Permit Characterization:

X	Private	___	Effluent Limited	___	Possible Interstate Effect
___	Federal	X	Water Quality Limited	___	Compliance Schedule Required
___	State	___	Whole Effluent Toxicity Program Required	___	Interim Limits in Permit
___	POTW	___	Pretreatment Program Required	___	Interim Limits in Other Document
X	TMDL	___	e-DMR Participant		

10. **Wastewater Sources and Treatment Description:**

The wastewater treatment plant consists of septic tank followed by coarse screening, flow equalization, biological treatment (extended aeration), clarification, UV disinfection, and cascade aeration. See flow diagram below.

The Certificate to Operate (CTO) the 0.01 MGD design flow facility was issued on October 6, 2011. The CTO can be found as Attachment 2.

Flow Diagram of Fauquier Springs Country Club WWTP

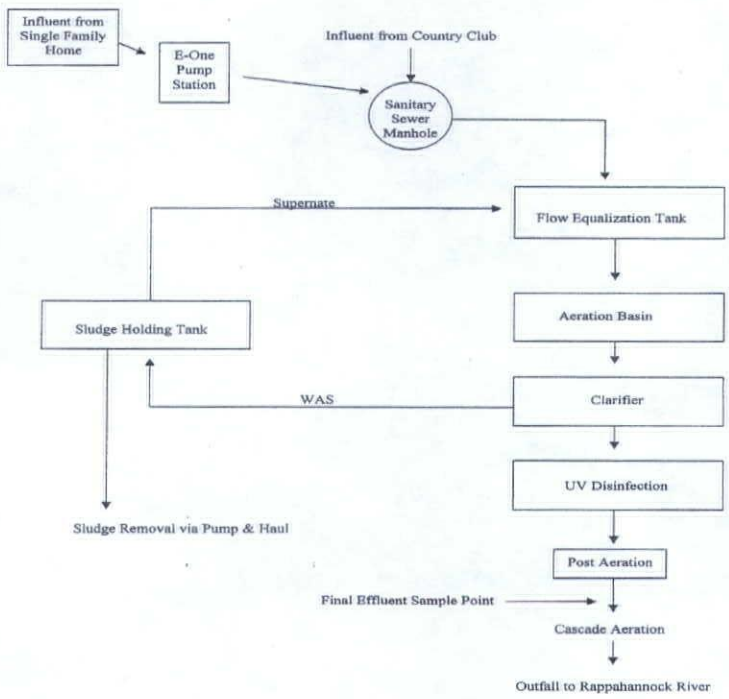
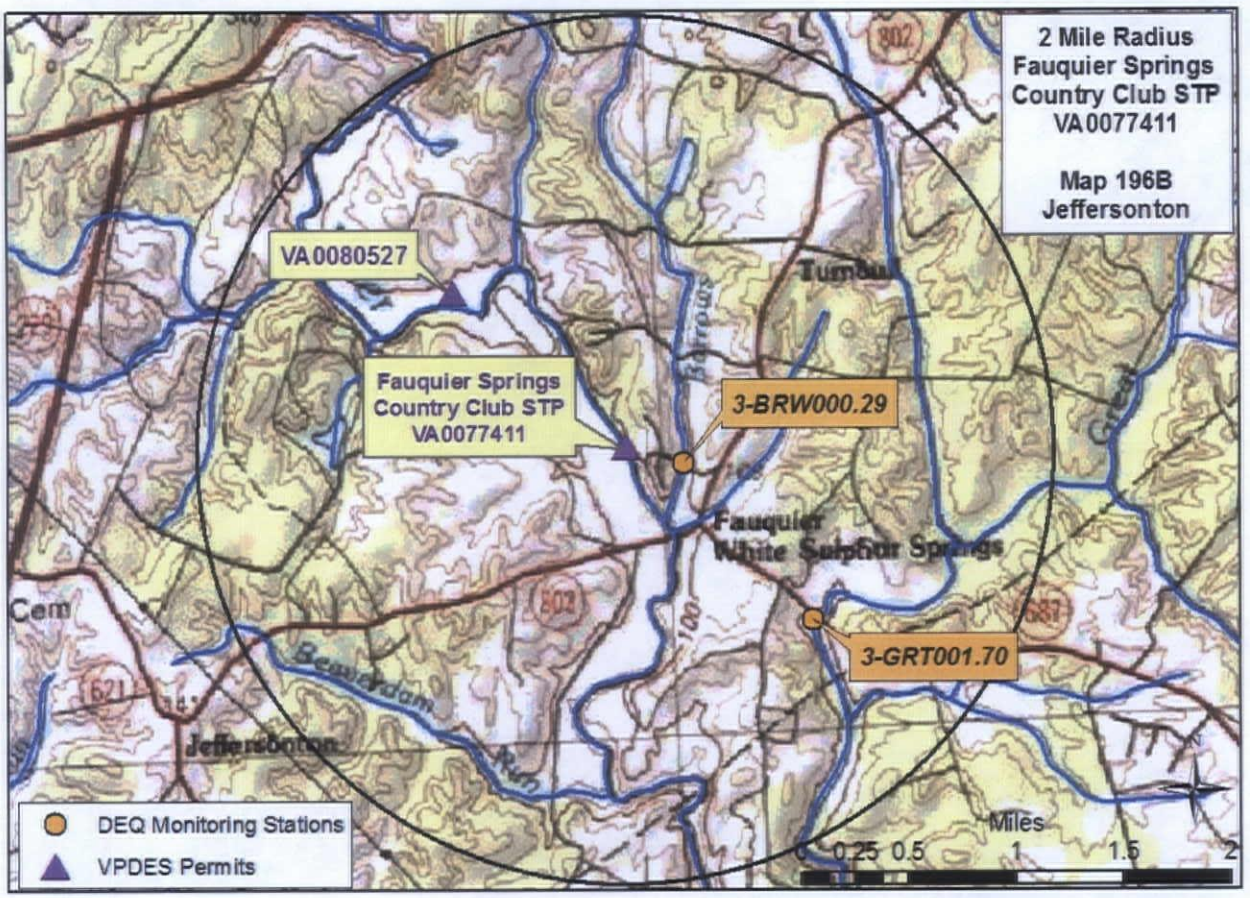


TABLE 1 – Outfall Description				
Outfall Number	**Discharge Sources**	**Treatment**	**Design Flow(s)**	**Outfall Latitude and Longitude**
001	Domestic and/or Commercial Wastewater	See Item 10 above.	0.01 MGD; 0.02 MGD	38° 39' 16" N 77° 52' 32" W



11. Sludge Treatment and Disposal Methods:

The sludge is aerobically stabilized and stored in a sludge holding tank. The stabilized and thickened sludge is transported to the Fauquier County Water and Sanitation Authority' Remington Regional Wastewater Treatment Facility (VA0076805) for ultimate processing and disposal.

12. Discharges and DEQ's Monitoring Stations within a 2-Mile Radius of Discharge Point

TABLE 2	
WQM Station/VPDES Permit Number	**Description**
3-BRW000.29	Barrows Run – DEQ Ambient Water Quality Monitoring Station, located at the Spring Drive Bridge, 0.29 river miles upstream from its confluences with the Rappahannock River. This station is not impacted by this discharge.
3-GRT001.70	Great Run – DEQ Ambient Water Quality Monitoring Station, located at the Route 687 Bridge. This station is not impacted by this discharge.
VA0080527	VPDES Permit for the Clevengers Village WWTP (0.9 MGD Design Flow). The discharge is approximately 0.39 river miles upstream from this discharge.

13. Material Storage:

TABLE 3 - Material Storage		
Materials Description	**Volume Stored**	**Spill/Stormwater Prevention Measures**
Soda Ash	2- 50 lbs bags	Storage/Lab Building

14. Site Inspection:

Performed by Joan Crowther on December 3, 2013 (see Attachment 3).

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

Outfall 001 discharges to a segment of the Rappahannock River that has not been monitored or assessed by DEQ.

The nearest downstream segment of the Rappahannock River that was assessed in the Virginia's 2012 Integrated Report (IR) is located approximately 7.8 miles downstream of Outfall 001. The following DEQ monitoring stations are located in this segment:

1) 3-RPP150.32, at Route 621 (ambient water quality) and
2) 3-RPP150.20, downstream of Route 621 (freshwater probabilistic).

DEQ benthic macroinvertebrate biological monitoring and associated chemical data finds this segment to be fully supporting the aquatic life and wildlife uses. The fish consumption use is fully supporting based on water column metals data.

E. coli monitoring find a bacterial impairment, resulting in an impaired classification for the recreation use. This impairment is nested within the downstream completed bacteria TMDL for the Rappahannock River.

b. 303(d) Listed Downstream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4							
Impairment Information in the Draft 2012 Integrated Report							
Waterbody Name	**Impaired Use**	**Cause**	**Distance From Outfall**	**TMDL completed**	**WLA**	**Basis for WLA**	**TMDL Schedule**
Rappahannock River	Recreation	*E. coli*	3.8 miles	Rappahannock River Basin Bacteria 01/23/2008	3.48E+10 cfu/year *E. coli*	126 cfu/100ml *E. coli* ---- 0.02 MGD	---

The Planning Statement dated August 6, 2013, can be found as Attachment 4.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260 (360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Rappahannock River, is located within Section 3 of the Rappahannock River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

The Freshwater Water Quality/Wasteload Allocation Analysis (Attachment 5) details other water quality criteria applicable to the receiving stream.

Some Water Quality Criteria are dependent on the temperature and pH and Total Hardness of the stream and final effluent. The stream and final effluent values used for part of Attachment 5 are as follows:

pH and Temperature for Ammonia Criteria:
The freshwater, aquatic life Water Quality Criteria for Ammonia are dependent on the instream temperature and pH. Since the effluent may have an impact on the instream values, the temperature and pH values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile temperature and pH values are used because they best represent the critical design conditions of the receiving stream.

Staff has re-evaluated/reviewed the receiving stream ambient monitoring data and the effluent data for pH and temperature. The receiving stream pH and temperature values were determined by using the DEQ ambient water quality data for the VAN-E20R waterbody for the period of February 1999 through August 2010.

TABLE 5

Parameter	90th Percentile Annual	10th Percentile	90th Percentile Wet	10th Percentile Wet
Temperature (°C)	23.4	--	14.8	--
pH (SU)	7.0	6.2	7.3	6.5

The effluent pH and temperature data were determined by using the daily effluent results from November 2011 through October 2013. This timeframe was selected because the "new" wastewater treatment plant was in operation and this time period demonstrated the treatment efficiency for the new plant. Certificate to Operate was issued on October 6, 2011.

TABLE 6

Parameter	90th Percentile Annual	10th Percentile
Temperature (°C)	26.9	--
pH (SU)	8.3	7.3

The effluent data are presented in Attachment 6.

Total Hardness for Hardness-Dependent Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's total hardness (expressed as mg/L calcium carbonate) as well as the total hardness of the final effluent.

The receiving stream total hardness data was determined by using the DEQ ambient water quality data for the VAN-E20R waterbody for the period of February 1999 through August 2010. The total hardness calculated for this waterbody was 44.2 mg/L.

There is no hardness data for this facility. Staff guidance suggests using a default hardness value of 50 mg/L CaCO3 for streams east of the Blue Ridge.

The hardness-dependent metals criteria in Attachment 5 are based on this default value.

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

> *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of 126 n/100 mls for a minimum of four weekly samples taken during any calendar month.

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Rappahannock River, is located within Section 3 of the Rappahannock River Basin. There are no special standards for this section.

e. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on July 29, 2013 for records to determine if

there are threatened or endangered species in the vicinity of the discharge. *Lasmigona sbuviridis,* Floater green, was identified within a 2 mile radius of the discharge. It is listed as a State threatened species. DGIF was coordinated with on July 29, 2013 for their comments regarding this reissuance. By email dated August 22, 2013 (Attachment 7), DGIF responded by stating:

> *According to our records, the Rappahannock River is a designated Threatened and Endangered (T&E) species water for the state Threatened (ST) green floater mussel. It is also predicted habitat for the federal Endangered state Endangered (FESE) dwarf wedgemussel.*
>
> *In order to protect aquatic resources, we generally recommend ultraviolet (UV) disinfection rather than chlorination disinfection. If chlorination becomes necessary and is used, we recommend and support continued dechlorination, prior to discharge. The ammonia limits proposed within the EPA rule are expressed on the basis of total ammonia-nitrogen (TAN). The proposed EPA ammonia limit for waters with mussels (not T&E mussels, any mussel species) is:*
>
> - *CMC (Criterion Maximum Concentration or acute) - 2.9 mg N/L (at pH 8 and 25C)*
> - *CCC (Criterion Continuous Concentration or chronic) - 0.26 mg N//L (at pH 8 and 25C) with a 4-day average within the 30 day average period no higher than 2.5 the CCC, which would be 0.65 mg N/L.*
>
> *The ammonia limits proposed within the EPA rule are the best information currently available regarding ammonia levels protective of mussels. Therefore, we recommend and support the EPA values being implemented in this permit for this and all future VPDES permits.*

The wastewater treatment plant has been disinfecting with UV since its installation of the new wastewater treatment in October 2011. DEQ has reviewed DGIF's comments and at this time no change to the draft permit are proposed. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

The stream that the facility discharges to is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 2. This segment of the Rappahannock River was classified as Tier 2 in 1997 and has been carried forward with each reissuance since then. No significant degradation to the existing water quality will be allowed. In accordance with current DEQ guidance, no significant lowering of water quality is to occur where permit limits are based on the following:

- The dissolved oxygen in the receiving stream is not lowered more than 0.2 mg/L from the existing levels;
- The pH of the receiving stream is maintained within the range 6.0-9.0 S.U.;
- There is compliance with all temperature criteria applicable to the receiving stream;
- No more than 25% of the unused assimilative capacity is allocated for toxic criteria established for the protection of aquatic life; and
- No more than 10% of the unused assimilative capacity is allocated for criteria for the protection of human health.

The antidegradation policy also prohibits the expansion of mixing zones to Tier 2 waters unless the requirements of 9VAC25-260-30.A.2 are met. The draft permit is not proposing an expansion of the existing mixing zone.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a. Effluent Screening:

Effluent data obtained from the facility's DMRs November 2011 to October 2013 have been reviewed and determined to be suitable for evaluation. The following exceedances were reported:

June 2012 – pH
July 2012 – Dissolved Oxygen
October 2012 – Dissolved Oxygen
January 2013 – *E.coli* Bacteria

The following pollutants require a wasteload allocation analysis: Ammonia as N.

b. Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{Co\,[\,Qe + (\,f\,)(Qs\,)\,] - [\,(\,Cs\,)(\,f\,)(\,Qs\,)\,]}{Qe}$$

Where:
WLA = Wasteload allocation
Co = In-stream water quality criteria
Qe = Design flow
f = Decimal fraction of critical flow from mixing evaluation
Qs = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
Cs = Mean background concentration of parameter in the receiving stream.

The Water Quality Standards contain two distinct mixing zone requirements. The first requirement is general in nature and requires the "use of mixing zone concepts in evaluating permit limits for acute and chronic standards in 9VAC25-260-140.B". The second requirement is specific and establishes special restrictions for regulatory mixing zones "established by the Board".

The Department of Environmental Quality uses a simplified mixing model to estimate the amount of mixing of a discharge with the receiving stream within specified acute and chronic exposure periods. The simplified model contains the following assumptions and approximations:

- The effluent enters the stream from the bank, either via a pipe, channel or ditch.
- The effluent velocity isn't significantly greater (no more than 1 - 2 ft/sec greater) than the stream velocity.
- The receiving stream is much wider than its depth (width at least ten times the depth).
- Diffusive mixing in the longitudinal direction (lengthwise) is insignificant compared with advective transport (flow).
- Complete vertical mixing occurs instantaneously at the discharge point. This is assumed since the stream depth is much smaller than the stream width.
- Lateral mixing (across the width) is a linear function of distance downstream.
- The effluent is neutrally buoyant (e.g. the effluent discharge temperature and salinity are not significantly different from the stream's ambient temperature and salinity).
- Complete mix is determined as the point downstream where the variation in concentration is 20% or less across the width and depth of the stream.
- The velocity of passing and drifting organisms is assumed equal to the stream velocity.

If it is suitably demonstrated that a reasonable potential for lethality or chronic impacts within the physical mixing area doesn't exist, then the basic complete mix equation, with 100% of the applicable stream flow, is appropriate. If the mixing analysis

determines there is a potential for lethality or chronic impacts within the physical mixing area, then the proportion of stream flow that has mixed with the effluent over the allowed exposure time is used in the basic complete mix equation. As such, the wasteload allocation equation is modified to account for the decimal fraction of critical flow (f).

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, ammonia as N is likely present since this is a WWTP treating sewage. As such, Attachment 8 details the mixing analysis results and WLA derivations for these pollutants.

Antidegradation Wasteload Allocations (AWLAs).

Since the receiving stream has been determined to be a Tier II water, staff must also determine antidegradation wasteload allocations (AWLAs). The steady state complete mix equation is used substituting the antidegradation baseline (Cb) for the in-stream water quality criteria (Co):

$$AWLA = \frac{Cb\,(Qe + Qs) - (Cs)(Qs)}{Qe}$$

Where:
- AWLA = Antidegradation-based wasteload allocation
- Cb = In-stream antidegradation baseline concentration
- Qe = Design flow
- Qs = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- Cs = Mean background concentration of parameter in the receiving stream.

Calculated AWLAs for the pollutants noted in b. above are presented in Attachment 5.

c. Effluent Limitations Toxic Pollutants, Outfall 001:

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with AWLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

In the 1993 permit reissuance, Ammonia as N effluent limitation for the 0.01743 MGD design flow was established as 15.4 mg/L monthly average and daily maximum. Documentation for this Ammonia as N effluent limitation is found in Attachment 9.

In the 2003 permit reissuance, the Ammonia as N effluent limitations were again reviewed and 15.6 mg/L monthly average and 23.4 mg/L daily maximum were established. The following documentation was the basis for the Ammonia as N effluent limitations.

> Ambient water quality pH and temperature data used to derive the criteria were available from STORET for monitoring station 3-RPP147.10 and are presented in Attachment 10. The 90th percentile pH value of 7.7 SU. and the 90th percentile temperature of 24.1°C were obtained. Staff re-evaluated the receiving stream ambient monitoring data for pH and temperature and found no significant differences from the data used to establish ammonia criteria and subsequent effluent limits in the 1998 permit. Therefore, the previously established criteria were carried forward in the 2003 reissuance process.

TABLE 7				
90th Percentile Comparison				
Season	1998 90th Percentile pH	2003 90th Percentile pH	1998 90th Percentile Temperature	2003 90th Percentile Temperature
Year Round	7.8	7.7	24.7°C	24.1°C

Antidegradation baseline was set for ammonia because it is present in sewage and had a reasonable potential to violate water quality criteria

The formula for determining the baseline is:

$$\text{Baseline} = c_s + (0.25)(\text{criteria} - c_s), \text{ where } c_s = \text{background stream concentration.}$$

The background concentration for ammonia was assumed to be 0.0 mg/L.

TABLE 8 - Antidegradation Baselines and WQ Based Criteria (Attachment 10)				
Ammonia as N (mg/L)	WQ Based Criteria		Antidegradation Baseline	
	Acute	Chronic	Acute	Chronic
	7.80	1.78	1.95	0.44

The antidegradation policy also prohibits the expansion of mixing zones to Tier 2 waters unless the requirements of 9 VAC 25-260-30.A.2. are met. The draft permit is not proposing an expansion of the existing mixing zone. The mixing zone analysis documentation was for the 2003 permit reissuance are in Attachment 10. The mixing zone predications were as follows:

- A complete mix assumption is appropriate for this situation providing no more than 9.27% of the 1Q10 was used.
- A complete mix assumption is appropriate in this situation and the entire 7Q10 or entire 30Q10 may be used.

Calculated AWLAs for the pollutants are summarized below. The most stringent WLAs were used to develop the permit limits.

TABLE 9 - Comparison of WLAs					
Ammonia as N (mg/L)	Water Quality Based WLAs			Antidegradation WLAs	
	Acute		Chronic	Acute	Chronic
	59.24	15.6*	151.19	140.67	37.80

*For stream dominated dischargers (defined as having an Instream Waste Concentration (IWC) of 50% or less at critical conditions), a steady state complete mix equation could result in a relatively large acute WLA. Discharges containing this large acute WLA could result in an introduction of concentrations of pollutants into the receiving stream that would not completely mix in a rapid manner and may possibly cause lethality in the allocated impact zone. In order to ensure protection against lethality, the acute WLA for discharges into stream dominated situations are set at two times the acute standard. Therefore, the acute WLA for ammonia was calculated as:

$$(7.80 \text{ mg/L})\ (2) = 15.6 \text{ mg/L}$$

The weekly average value of 23.4 mg/L was determined by multiplying the monthly average value (15.6 mg/L) by a 1.5 factor.

DEQ guidance suggests using a sole data point of 9.0 mg/L for discharges containing domestic sewage to ensure the evaluation adequately addresses the potential for Ammonia as N to be present in the discharge containing domestic sewage. During the 2008 permit reissuance, the Ammonia as N monthly average was rounded from 15.6 mg/L to 16 mg/L and the weekly maximum was corrected. The practice of multiplying the monthly average by 1.5 to determine the weekly maximum was no longer done. The monthly average and weekly maximum effluent limitations for toxic parameters are the same value; therefore, during the 2008 permit reissuance the Ammonia as N weekly average was changed to 16 mg/L. It is staff's best professional judgment that the existing Ammonia as N effluent limitations are still appropriate and will be carried forward in this permit reissuance. See Attachment 10 for the Ammonia as N statistical calculations.

3) Metals/Organics:

No metals or organics data were available for review; therefore, no effluent limits are proposed.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), *E. coli* Bacteria, and pH limitations are proposed.

Dissolved Oxygen and BOD_5 limitations are based on the stream modeling conducted in January 1988 and July 1998 (Attachment 11) and are set to ensure that the receiving stream D.O. does not decrease more than 0.2 mg/l to meet the requirements of the antidegradation policy.

It is staff's practice to equate the Total Suspended Solids limits with the BOD_5 limits. TSS limits are established to equal BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage. The limit for Total Suspended Solids is based on Best Professional Judgment.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e. Effluent Limitations and Monitoring Summary:

The effluent limitations are presented in the following table. Limits were established for Flow, BOD_5, Total Suspended Solids, Ammonia as N, pH, and Dissolved Oxygen.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual (2010).

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

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19.A. Effluent Limitations/Monitoring Requirements:

Design flow is 0.01 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the issuance of the CTO for the 0.02 MGD facility or the permit's expiration date, whichever comes first.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimated
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
BOD_5	3,5	30 mg/L 1.1 kg/day	45 mg/L 1.7 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS)	2	30 mg/L 1.1 kg/day	45 mg/L 1.7 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen (DO)	3	NA	NA	6.0 mg/L	NA	1/D	Grab
Ammonia, as N (mg/L)	3,5	16	16	NA	NA	1/M	Grab
E. coli (Geometric Mean)[a]	3	126 n/100mls	NA	NA	NA	1/W	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 11

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/M = Once every month.
1/W = Once every week.

Estimated = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge

Grab = An individual sample collected over a period of time not to exceed 15 minutes.

(a) = Between 10 AM and 4 PM.

B. Effluent Limitations/Monitoring Requirements:

Design flow is 0.02 MGD.

Effective Dates: During the period beginning with the issuance of the CTO for the 0.02 MGD facility and lasting until the permit's expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimated
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
BOD_5	3,5	30 mg/L 2.3 kg/day	45 mg/L 3.4 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS)	2	30 mg/L 2.3 kg/day	45 mg/L 3.4 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen (DO)	3	NA	NA	6.0 mg/L	NA	1/D	Grab
Ammonia, as N (mg/L)	3,5	16	16	NA	NA	1/M	Grab
E. coli (Geometric Mean)[a]	3	126 n/100mls	NA	NA	NA	1/W	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 11

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/M = Once every month.
1/W = Once every week.

Estimated = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge

Grab = An individual sample collected over a period of time not to exceed 15 minutes.

(a) = Between 10 AM and 4 PM.

C. Groundwater Monitoring Requirements:

Effective Dates: During the period beginning with the permit's effective date and lasting until the permit expiration date.
For wells: MW1, MW3 and MW4

Parameters	Units	Limit	Monitoring Requirements	
			Frequency	Sample Type
Static water level	Ft.	NL	1/3M	Measured
pH	S.U.	NL	1/3M	Grab
Conductivity	µmho/cm	NL	1/3M	Grab
Total Organic Carbon	mg/L	NL	1/3M	Grab
Total Dissolved Solids	mg/L	NL	1/3M	Grab
Ammonia as N	mg/L	NL	1/3M	Grab
Temperature	deg C	NL	1/3M	IS

1. Sampling shall be conducted quarterly and reported quarterly. The quarterly reporting periods shall be January, April, July, and October. The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

2. The permittee may request in writing that the sampling frequency be reduced or eliminated after one year of monitoring.

3. The static water level shall be measured prior to bailing the well water for sampling. At least three volumes of groundwater shall be withdrawn immediately before sampling each well.

1/3M = Once per quarter.
IS = Immersion Stabilization
Grab = An individual sample collected over a period not to exceed 15-minutes.

20. Other Permit Requirements:

a. Part I.B. of the permit contains quantification levels and compliance reporting instructions.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a. **95% Capacity Reopener.** The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. The facility is a PVOTW.

b. **Indirect Dischargers.** Required by VPDES Permit Regulation, 9VAC25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. **O&M Manual Requirement.** Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. **CTC, CTO Requirement.** The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e. **Licensed Operator Requirement.** The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and by the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class IV operator.

f. **Reliability Class.** The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a Reliability Class of II.

g. **Sludge Reopener.** The VPDES Permit Regulation at 9VAC25-31-220.C requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

h. **Sludge Use and Disposal.** The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

i. **TMDL Reopener.** This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

j. **Groundwater Monitoring.** This special condition requires the pemittee to continue the groundwater monitoring in accordance with the *Protocol for Groundwater Sampling* contained in the "Fauquier Springs Country Club Wastewater Treatment Plant Updated Groundwater Monitoring Plan dated May 2008 and P.E. dated May 19, 2009".

k. **Financial Assurance.** This permittee is required by Code of Virginia §62.1.-44.18:3 and the Board's Financial Assurance Regulation, 9VAC25-650-1, *et seq.* to submit a closure plan and maintain adequate financial assurance in the event the facility ceases operations. This regulation is applicable to owners and operators of PVOTWs with a design flow >0.0001 MGD but <0.040 MGD and treating sewage from private residences. The permitted facility is a PVOTW with a design flow of 0.01 MGD with an additional design flow tier of 0.02 MGD, and treats sewage generated from three private residences.

l. **Treatment Works Closure Plan.** The State Water Control Law §62.1-44.15:1.1, makes it illegal for an owner to cease operation and fail to implement a closure plan when failure to implement the plan would result in harm to human health or the environment. This condition is used to notify the owner of the need for a closure plan where a facility is being replaced or is expected to close.

22. Permit Section Part II.

Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:
   1. The Groundwater Corrective Action Plan Special Condition was removed since the permittee replaced the lagoon wastewater treatment plant with a 0.01 MGD extended aeration package plant.
   2. Financial Assurance and Treatment Works Closure Plan special conditions were added because three residential homes are being provided sanitary sewer treatment by this wastewater treatment plant and this plant is privately owned. (9 VAC 25-650).

b. Monitoring and Effluent Limitations:
   1. The Total Residual Chlorine effluent limitations and monitoring were removed due to the UV Disinfection installation.
   2. The *E. coli's* frequency of analysis was increased in accordance with the VPDES Permit Manual (2010) and the Virginia Water Quality Standards.
   3. The Effluent Limitations/Monitoring Requirement page for the 0.02 MGD lagoon wastewater treatment plant was removed since this plant was replaced with a 0.01 MGD extended aeration package plant. The lagoon was properly abandoned.
   4. The Groundwater Monitoring Requirements were modified as follows: 1) *E. coli* bacteria monitoring was eliminated; 2)

Nitrite-N monitoring was eliminated; 3) Nitrate-N monitoring was eliminated; 4) the remaining parameters are the same except the frequency of monitoring was reduced from monthly to quarterly.

23. Variances/Alternate Limits or Conditions:

There are no variances / alternate limits or conditions in this draft permit.

25. Public Notice Information:

First Public Notice Date: 2/12/14 Second Public Notice Date: 2/19/14

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3925, joan.crowther@deq.virginia.gov. See Attachment 12 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s): None.

Staff Comments: After the public comment period had closed, staff became aware that this wastewater treatment plant was providing sanitary sewerage service to three residential homes. It was learned that one of these homes had been connected to the plant in 1960s and the other two homes were connected ~2004. Because this is a privately owned wastewater treatment plant and the design flows are greater than 0.001 MGD and less than 0.04 MGD, the Closure Plans and Demonstration of Financial Capability Requirement Regulation (9 VAC 25-650) must be complied with. Therefore, the reissuance was delayed so that this regulation's requirements could be addressed and complied with. The Financial Assurance was signed off by DEQ-CO on October 29, 2014. DEQ-NRO was notified on November 4, 2014 that all financial assurance requirements had been completed.

Public Comment: 1) DGIF requested to review this permit in accordance with the VPDES Memorandum of Understanding dated April 16, 2007. See Section 15.e of this fact sheet for their comments.
2) No comments were received during the public comment period.

Attachment Number	Description of Attachment
1	1997 Flow Frequency Determination
2	Certificate to Operate dated October 6, 2011
3	Site Inspection
4	Planning Statement dated August 6, 2013
5	Freshwater Water Quality/Wasteload Allocation Analysis dated January 6, 2014
6	Effluent Data November 2011 through October 2013
7	DGIF Comments dated August 22, 2013
8	2014 Mixing Analysis Results
9	1993 Ammonia as N Calculation Documentation
10	2003 Ammonia as N Calculation Documentation
11	Stream Models – January 1988, July 1998
12	Public Notice

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Fauquier Springs Country Club STP - VA#0077411

TO: James A. Olson, NRO

FROM: Paul E. Herman, P.E., WQAP

DATE: November 4, 1997

COPIES: Ron Gregory, Charles Martin, File

This memo supercedes my February 9, 1993 memo to Joan Crowther concerning flow frequencies for the subject facility.

The Fauquier Springs Country Club STP discharges to the Rappahannock River near the Route 802 bridge in Fauquier County, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

The USGS operated a continuous record gage on the Rappahannock River near Warrenton, VA (#01662000) from 1943 to 1986. The gage was located approximately 10 miles upstream from the discharge point. The flow frequencies for the gage and the discharge point are presented below. The values at the discharge point were determined by drainage area proportions and do not address any withdrawals, discharges, or springs lying upstream.

Rappahannock River near Warrenton, VA (#01662000):

Drainage Area = 195 mi

1Q10 = 2.1 cfs	High Flow 1Q10 = 25 cfs
7Q10 = 2.5 cfs	High Flow 7Q10 = 31 cfs
30Q5 = 9.1 cfs	HM = 37 cfs

Rappahannock River at discharge point:

Drainage Area = 205.7 mi

1Q10 = 2.2 cfs	1.42 MGD	High Flow 1Q10 = 26 cfs	16.8 mgd
7Q10 = 2.6 cfs	1.68 MGD	High Flow 7Q10 = 33 cfs	21.3 mgd
30Q5 = 9.6 cfs	6.2 MGD	HM = 39 cfs	25.2 mgd
30Q10 = 5.5 cfs	3.6 msd	Highflow 30Q10 = 47 cfs	30.4 mgd

The high flow months are December through May. If you have any questions concerning this analysis, please let me know.

Attachment 1

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

October 6, 2011

Fauquier County
Fauquier Springs CC WWTP Replacement
PTL#25369, Permit VA0077411

Mr. William Fendley
Sulphur Springs Investment Corp
9236 Tournament Drive
Warrenton, VA 22186

Dear Mr. Fendley:

In accordance with 9VAC25-790-190 of the Commonwealth of Virginia's *Sewage Collection and Treatment Regulations*, this letter transmits the Certificate to Operate (CTO) for Fauquier Springs Country Club WWTP Replacement located in Fauquier County. The CTO is being issued based on the Application for Certificate to Operate dated August 22, 2011, and received by this office on August 23, 2011.

Please be advised that in accordance with your VPDES Permit VA0077411 Part I.C.3., an updated O&M Manual shall be submitted within 90 days of the issuance of the CTO.

On October 5, 2011, I spoke with Don Hearl from ESS who operates the treatment plant regarding the Closure Plan for the old wastewater lagoon. Based on my conversation with Mr. Hearl, DEQ understands that there will be no further discharge from the old wastewater lagoon and that any further dewatering will be processed through the new WWTP. If there is an emergency situation that will require the lagoon to discharge, you shall notify DEQ of the situation and provide a description of the reasoning for the discharge. In addition, the discharge from the lagoon shall be monitored on a weekly basis for TSS, BOD, and Ammonia as N until such time that the discharge ceases or the discharge from the lagoon no longer meets the permitted limits for one of the aforementioned parameters. This monitoring shall be in addition to the required monitoring for Outfall 001.

Attachment 2

If you have any questions about this letter or the approval process, please contact me at (703)-583-3834 or alison.thompson@deq.virginia.gov.

Respectfully,

Alison Thompson
Water Permits Technical Reviewer

cc: VPDES Permit File VA0077411
VDH District Office, attn: Environmental Health Manager
Fauquier County Local Building Official
Earl Sutherland, Patton Harris Rust & Associates, 117 East Piccadilly St, Ste 200, Winchester VA 226
Don Hearl, ESS

Attachment: CTO

Department of Environmental Quality
APPLICATION for CERTIFICATE TO OPERATE
Under the Sewage Collection and Treatment Regulations 9 VAC 25-790

See instructions. Submit 2 copies of this form and any attachments. Form will expand as you enter information.

Project Title: (as it appears on plans) Fauquier Springs Country Club – Wastewater Treatment Plant Replacement P.E. Seal Date on Cover: 1 April 2010 Specifications Title and Date: Fauquier Springs Country Club – Wastewater Treatment Plant Replacement, April 2010	
Location of Project: SR 687 @ Rappahannock River	County/City: Fauquier County
Receiving Wastewater Collection System(s): NA	
Receiving Sewage Treatment Plant(s): NA	
PROJECT OWNER: Sulphur Springs Investment Corp.	**PROJECT ENGINEER**
Owner Contact Name: William Fendley	Name: Earl R. Sutherland, P. E.
Signature and Date:	Company Name: Patton Harris Rust & Associates
Address: 9236 Tournament Drive Warrenton, Virginia 22186	Address: 117 East Piccadilly Street, Suite 200 Winchester, Virginia 22601
Phone: 540.347.4025	Phone: 540.667.2139
Email: info@fauquier springs.com	Email: esutherland@pennoni.com

PTL NUMBER FROM CERTIFICATE TO CONSTRUCT: ***24868***

Attach Copy of the original Certificate to Construct if issued prior to November 9, 2008, or if a WQIF project. If applicable, provide verification of compliance with any conditions in the Certificate to Construct.

Design Sewage Flow: (a) average daily flow (MGD): 0.010 (b) peak flow (MGD): 0.015

For sewage treatment plant projects, provide the VPDES/VPA Permit Number: VA0077411
Is a new Discharge Monitoring Report (DMR) required? Yes No ☒
For Pump Stations and Sewage Treatment Plants check Reliability Class: I II ☒ III

The following statement must be signed and sealed by the inspecting engineer: (DEQ will not conduct a confirming inspection.)

"Statement of Completion:
I hereby certify that the construction work was completed in accordance with the approved referenced design documents or revised only in accordance with 9 VAC 25-790-180.B. and I have completed sufficient inspections to certify the work."

COMMONWEALTH OF VIRGINIA
E.R. SUTHERLAND
Lic. No. 5073
PROFESSIONAL ENGINEER

17 AUG 11

Inspecting Licensed Engineer's Signature and Original Seal (signed and dated)

VA DEPARTMENT OF ENVIRONMENTAL QUALITY
AUG 23 2011
REGIONAL OFFICE
WOODBRIDGE, VA

For DEQ use only:

In accordance with *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this form, signed by the appropriate DEQ representative, serves as the Certificate to Operate for the referenced project.

WG FENDLEY — President FSCC — Name

Signature

8/22/11 — Date

CTO PTL Number

Department of Environmental Quality Authorized Representative

For sewage treatment plants, an Operation and Maintenance Manual must be submitted to the DEQ Regional Office in accordance with 9 VAC 25-790 and VPDES/VPA permit requirements.

For pump stations, an Operation and Maintenance Manual must be maintained for the facility in accordance with 9 VAC 25-790, but is NOT to be submitted to DEQ. The pump station must be operated and maintained in accordance with that manual.

Alison Thompson — 10/6/11 — PTC# 25369

Administrative Tracking Form for CTC Application

1. Who must apply for a Certificate to Construct (CTC)?
   9 VAC 25-790-50 and 60 define who must apply for a CTC. In general, all new or expanded sewage treatment plant projects; major modifications of sewage treatment plants; gravity sewer projects with average day design flows over 40,000 gpd; and pump stations/force mains with average day design flows >2000 gpd must apply for a CTC.

2. How long do you have to process the CTC?
   The CTC application is to be submitted at least 30 days prior to the desired start of construction. Either an email notice of an incomplete application or the approval must be processed within that time

3. Input the CTC application into the Plans Tracking Log as 'CTC Application'. See separate guidance on the PT log. The Log will generate a tracking number. That number is added to the submitted form by hand as the PTL number.

Project Name:	Fauquier Springs VJWTP Improv		
Date Received:	4-29-10	PTL #:	24868

4. Verify that all Information Requested on the Form is Provided:

Item	Provided?			Notes
	Yes	No	N/A	
Project Title with Date (plans and specs)	N			Specifications may be on the plans so not all projects have separate specs
Project Location	N			Must have City/County
Receiving Systems Identified	N			Not applicable if this project owner owns the downstream collection and treatment
Contact Information	N			Must have
Project Description Attached	N			Must have
Letter of Acceptance			N	Must have for pump stations, collection systems, and satellite reclamation systems
Reliability Rating from VDH for Pump Stations only			N	Need rating and statement of how meeting the rating
Design Sewage Flows	N			Must have
Project Components checked	N			Must have
VPDES/VPA Permit Referenced	N			Must have for sewage treatment plants
Loan/Grant status			N	WQIF projects cannot utilize this abbreviated process. Return the project.
Professional Engineer signature and seal	N			Must have
Design exceptions noted?			N	If yes, must have attached.

Note missing items and send email to project owner and engineer.

Log of telephone conversations and additional items received:

FAUQUIER SPRINGS COUNTRY CLUB

WASTEWATER TREATMENT PLANT UPGRADE PROJECT

PROJECT DESCRIPTION

The project consists of the replacement of an existing 20,000 GPD aerated lagoon with a 10,000 GPD extended aeration treatment facility. The new treatment works will be located on the same site as the existing treatment facility and will discharge through the same outfall line. The treatment works will include coarse screening, flow equalization, biological treatment (extended aeration variant of the activated sludge process), and clarification. The existing chlorination/dechlorination facilities, cascade aeration, and outfall line will remain in service.

The process will also include an aerated biosolids stabilization and holding tank. The stabilized and thickened sludge will be transported to the Fauquier County Water and Sanitation Authority Remington Regional Wastewater Treatment Facility for ultimate processing and disposal.

Once the new treatment works is operational the existing lagoon will be abandoned. The remaining liquid in the pond will be pumped to the new wastewater treatment facility for treatment. Once the pond is dewatered the residual sludge will be lime stabilized and all structures and equipment disinfected and removed. Once sludge stabilization is complete, the pond will be filled in compacted lifts with clean soil, covered with a clay cap and topsoil, and seeded.

RELIABILITY MEASURES

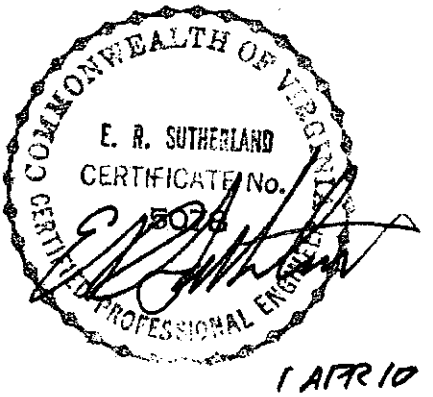
The VPDES Permit designates the facility as Class II Reliability.

Reliability requirements will be attained by the following measures:

All critical facility components (i. e.; equalization pumps, aeration blowers) will have in place, redundant units.

The influent flow equalization basin will have an audible and visible high water alarm.

The facility has the capacity to store between 6,000 gallons and 10,000 gallons on an emergency basis without overflow or bypass of the treatment process units.



1 APR 10

Memorandum

Subject: Fauquier Springs Country Club Wastewater Treatment Plant Site Inspection
Date: January 14, 2014
TO: File
From: Joan C. Crowther

On December 16, 2013, I met with Ed Evers, Fauquier Springs Country Club, to inspect the 0.01 MGD wastewater treatment plant. The plant consists of a septic tank followed by an equalization tank, extended aeration plant with UV disinfection and post step aeration. This plant was installed in October 2011 to replace a lagoon. The lagoon has since been properly abandoned and groundwater monitoring is still being conducted to determine the effects of the lagoon while it was in operation.

Fauquier Springs' staff is responsible for performing the maintenance, operation, and monitoring of the wastewater treatment plant. They perform the operational and effluent testing for five days and Environmental System Services (ESS) perform the testing and effluent testing the remaining two days of the week. ESS is under contract to assist should any operational problems occur. ESS also performs the laboratory analysis for the effluent parameters.

The wastewater treatment plant appeared to be operating properly although occasionally molasses has to be fed at the head of the extended aeration plant to keep the "bugs" happy. At the time of the visit, the laboratory records were reviewed and no problems were found as to recording who, when, and what was done at the plant. A detailed laboratory inspection was not performed.

The abandoned lagoon is approximately 150 feet from the shore of the Rappahannock River. A golf fairway is between the lagoon and the Rappahannock River. There is also a drainage swale that runs beside the plant and lagoon across the fairway and enters the Rappahannock River just above the plant's discharge pipe.

The last technical and laboratory inspection for this facility was conducted on December 16, 2004 when the lagoon was still in operation.

Attachment 3

To:	Joan C. Crowther
From:	Jennifer Carlson
Date:	August 6, 2013
Subject:	Planning Statement for Fauquier Springs Country Club WWTP
Permit Number:	VA0077411

Information for Outfall 001:

Discharge Type: Municipal
Discharge Flow: 0.02 MGD with a tier for 0.010 MGD
Receiving Stream: Rappahannock River
Latitude / Longitude: 38°39'16" / 77°52'32"
Rivermile: 158.41
Streamcode: 3-RPP
Waterbody: VAN-E02R
Water Quality Standards: Section 3, Class III, Special Standards - none
Drainage Area: 205.7 Sq.Mil; Topo Map – Jeffersonton, 196B

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   Outfall 001 discharges to a segment of the Rappahannock River that has not been monitored or assessed. The nearest downstream DEQ ambient water quality monitoring station on the Rappahannock River is located approximately 7.8 miles downstream of Outfall 001. This monitoring station, 3-RPP150.32, is located at the Route 621 bridge crossing. The following is the water quality summary for this segment of the Rappahannock River, as taken from the Draft 2012 Integrated Report*:

   Class III, Section 3.

   The following are the DEQ monitoring stations located on the Rappahannock River:
   - *3-RPP150.32, at Route 621 (ambient water quality)*
   - *3-RPP150.20, downstream of Route 621 (freshwater probabilistic)*

   DEQ benthic macroinvertebrate biological monitoring and associated chemical data finds this segment to be fully supporting the aquatic life and wildlife uses. The fish consumption use is fully supporting based on water column metals data.

   E. coli monitoring find a bacterial impairment, resulting in an impaired classification for the recreation use. This impairment is nested within the downstream completed bacteria TMDL for the Rappahannock River.

**Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.*

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

No.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

Yes.

Table B. Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the Draft 2012 Integrated Report*							
Rappahannock River	Recreation	*E. coli*	3.8 miles	Rappahannock River Basin Bacteria 01/23/2008	3.48E+10 cfu/year *E. coli*	126 cfu/100ml *E. coli* ---- 0.02 MGD	---

**Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.*

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

The tidal Rappahannock River, which is located approximately 46 miles downstream of this facility, is listed with a PCB impairment. In support for the PCB TMDL that is scheduled for development by 2016 for the tidal Rappahannock River, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor municipal facility. Low-level PCB analysis uses EPA Method 1668, which is capable of detecting low-level concentrations for all 209 PCB congeners. DEQ staff has concluded that low-level PCB monitoring is not warranted for this facility, as there are not any stream segments immediately downstream of the facility that are listed with a PCB impairment. Fish tissue monitoring has been conducted on the free flowing Rappahannock River and there have been no exceedances of the fish tissue criterion for PCBs. Based upon this information, this facility will not be requested to monitor for low-level PCBs.

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

There are no public water supply intakes located within 5 miles of this discharge.

Attachment 5

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Fauquier Springs Permit No.: VA0077411

Receiving Stream: Rappahannock River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	44.2 mg/L	1Q10 (Annual) =	1.42 MGD	Annual - 1Q10 Mix =	4.55 %	Mean Hardness (as CaCO3) =	50 mg/L
90% Temperature (Annual) =	23.4 deg C	7Q10 (Annual) =	1.68 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	26.9 deg C
90% Temperature (Wet season) =	14.8 deg C	30Q10 (Annual) =	3.6 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	deg C
90% Maximum pH =	7 SU	1Q10 (Wet season) =	16.8 MGD	Wet Season - 1Q10 Mix =	41.84 %	90% Maximum pH =	8.3 SU
10% Maximum pH =	6.2 SU	30Q10 (Wet season)	30.4 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2	30Q5 =	6.5 MGD			Discharge Flow =	0.02 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	25.2 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	3.2E+05	--	--	na	9.9E+01	--	--	na	3.2E+04	--	--	na	**3.2E+04**
Acrolein	0	--	--	na	9.3E+00	--	--	na	3.0E+03	--	--	na	9.3E-01	--	--	na	3.0E+02	--	--	na	**3.0E+02**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	3.2E+03	--	--	na	2.5E-01	--	--	na	3.2E+02	--	--	na	**3.2E+02**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	1.3E+01	--	na	6.3E-01	7.5E-01	--	na	5.0E-05	5.4E+01	--	na	6.3E-02	**1.3E+01**	--	na	**6.3E-02**
Ammonia-N (mg/l) (Yearly)	0	3.25E+01	3.33E+00	na	--	1.38E+02	6.02E+02	na	--	8.98E+00	8.32E-01	na	--	6.46E+02	1.51E+02	na	--	**1.38E+02**	**1.51E+02**	na	--
Ammonia-N (mg/l) (High Flow)	0	3.61E+01	5.81E+00	na	--	1.27E+04	8.83E+03	na	--	9.02E+00	1.45E+00	na	--	7.59E+03	2.21E+03	na	--	**7.59E+03**	**2.21E+03**	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	1.3E+07	--	--	na	4.0E+03	--	--	na	1.3E+06	--	--	na	**1.3E+06**
Antimony	0	--	--	na	6.4E+02	--	--	na	2.1E+05	--	--	na	6.4E+01	--	--	na	2.1E+04	--	--	na	**2.1E+04**
Arsenic	0	3.4E+02	1.5E+02	na	--	1.4E+03	1.3E+04	na	--	8.5E+01	3.8E+01	na	--	6.1E+03	3.2E+03	na	--	**1.4E+03**	**3.2E+03**	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	6.4E+05	--	--	na	5.1E+01	--	--	na	6.4E+04	--	--	na	**6.4E+04**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	2.5E+00	--	--	na	2.0E-04	--	--	na	2.5E-01	--	--	na	**2.5E-01**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	2.3E+02	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	**2.3E+01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	2.3E+02	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	**2.3E+01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	2.3E+02	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	**2.3E+01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	2.3E+02	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	**2.3E+01**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	6.7E+03	--	--	na	5.3E-01	--	--	na	6.7E+02	--	--	na	**6.7E+02**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	2.1E+07	--	--	na	6.5E+03	--	--	na	2.1E+06	--	--	na	**2.1E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.8E+04	--	--	na	2.2E+00	--	--	na	2.8E+03	--	--	na	**2.8E+03**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.8E+06	--	--	na	1.4E+02	--	--	na	1.8E+05	--	--	na	**1.8E+05**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	6.2E+05	--	--	na	1.9E+02	--	--	na	6.2E+04	--	--	na	**6.2E+04**
Cadmium	0	1.6E+00	6.0E-01	na	--	6.8E+00	5.1E+01	na	--	3.9E-01	1.5E-01	na	--	2.8E+01	1.3E+01	na	--	**6.8E+00**	**1.3E+01**	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	2.0E+04	--	--	na	1.6E+00	--	--	na	2.0E+03	--	--	na	**2.0E+03**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	1.0E+01	3.7E-01	na	1.0E+01	6.0E-01	1.1E-03	na	8.1E-04	4.3E+01	9.1E-02	na	1.0E+00	**1.0E+01**	**9.1E-02**	na	**1.0E+00**
Chloride	0	8.6E+05	2.3E+05	na	--	3.6E+06	2.0E+07	na	--	2.2E+05	5.8E+04	na	--	1.5E+07	4.9E+06	na	--	**3.6E+06**	**4.9E+06**	na	--
TRC	0	1.9E+01	1.1E+01	na	--	8.0E+01	9.4E+02	na	--	4.8E+00	2.8E+00	na	--	3.4E+02	2.3E+02	na	--	**8.0E+01**	**2.3E+02**	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	5.2E+05	--	--	na	1.6E+02	--	--	na	5.2E+04	--	--	na	**5.2E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.6E+05	--	--	na	1.3E+01	--	--	na	1.6E+04	--	--	na	**1.6E+04**
Chloroform	0	--	--	na	1.1E+04	--	--	na	3.6E+06	--	--	na	1.1E+03	--	--	na	3.6E+05	--	--	na	**3.6E+05**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	5.2E+05	--	--	na	1.6E+02	--	--	na	5.2E+04	--	--	na	**5.2E+04**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	4.9E+04	--	--	na	1.5E+01	--	--	na	4.9E+03	--	--	na	**4.9E+03**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	3.5E-01	3.5E+00	na	--	2.1E-02	1.0E-02	na	--	1.5E+00	8.7E-01	na	--	**3.5E-01**	**8.7E-01**	na	--
Chromium III	0	3.0E+02	3.8E+01	na	--	1.3E+03	3.2E+03	na	--	7.3E+01	9.5E+00	na	--	5.3E+03	8.1E+02	na	--	**1.3E+03**	**8.1E+02**	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	6.8E+01	9.4E+02	na	--	4.0E+00	2.8E+00	na	--	2.9E+02	2.3E+02	na	--	**6.8E+01**	**2.3E+02**	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	3.3E+03	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	1.8E-03	--	--	na	2.3E+00	--	--	na	**2.3E+00**
Copper	0	6.4E+00	4.5E+00	na	--	2.7E+01	3.8E+02	na	--	1.6E+00	1.1E+00	na	--	1.1E+02	9.5E+01	na	--	**2.7E+01**	**9.5E+01**	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	9.3E+01	4.4E+02	na	5.2E+06	5.5E+00	1.3E+00	na	1.6E+03	4.0E+02	1.1E+02	na	5.2E+05	**9.3E+01**	**1.1E+02**	na	**5.2E+05**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	3.9E+00	--	--	na	3.1E-04	--	--	na	3.9E-01	--	--	na	**3.9E-01**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.8E+00	--	--	na	2.2E-04	--	--	na	2.8E-01	--	--	na	**2.8E-01**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	4.7E+00	8.5E-02	na	2.8E+00	2.8E-01	2.5E-04	na	2.2E-04	2.0E+01	2.1E-02	na	2.8E-01	**4.7E+00**	**2.1E-02**	na	**2.8E-01**
Demeton	0	--	1.0E-01	na	--	--	8.5E+00	na	--	--	2.5E-02	na	--	--	2.1E+00	na	--	--	**2.1E+00**	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	7.2E-01	1.4E+01	na	--	4.3E-02	4.3E-02	na	--	3.1E+00	3.6E+00	na	--	**7.2E-01**	**3.6E+00**	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	2.3E+02	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	**2.3E+01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	4.2E+05	--	--	na	1.3E+02	--	--	na	4.2E+04	--	--	na	**4.2E+04**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	3.1E+05	--	--	na	9.6E+01	--	--	na	3.1E+04	--	--	na	**3.1E+04**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	6.2E+04	--	--	na	1.9E+01	--	--	na	6.2E+03	--	--	na	**6.2E+03**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	3.5E+02	--	--	na	2.8E-02	--	--	na	3.5E+01	--	--	na	**3.5E+01**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	2.1E+05	--	--	na	1.7E+01	--	--	na	2.1E+04	--	--	na	**2.1E+04**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	4.7E+05	--	--	na	3.7E+01	--	--	na	4.7E+04	--	--	na	**4.7E+04**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	2.3E+06	--	--	na	7.1E+02	--	--	na	2.3E+05	--	--	na	**2.3E+05**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	3.3E+06	--	--	na	1.0E+03	--	--	na	3.3E+05	--	--	na	**3.3E+05**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	9.5E+04	--	--	na	2.9E+01	--	--	na	9.5E+03	--	--	na	**9.5E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.9E+05	--	--	na	1.5E+01	--	--	na	1.9E+04	--	--	na	**1.9E+04**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.6E+05	--	--	na	2.1E+01	--	--	na	2.6E+04	--	--	na	**2.6E+04**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	1.0E+00	4.8E+00	na	6.8E-01	6.0E-02	1.4E-02	na	5.4E-05	4.3E+00	1.2E+00	na	6.8E-02	**1.0E+00**	**1.2E+00**	na	**6.8E-02**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.4E+07	--	--	na	4.4E+03	--	--	na	1.4E+06	--	--	na	**1.4E+06**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	2.8E+05	--	--	na	8.5E+01	--	--	na	2.8E+04	--	--	na	**2.8E+04**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	3.6E+08	--	--	na	1.1E+05	--	--	na	3.6E+07	--	--	na	**3.6E+07**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.5E+06	--	--	na	4.5E+02	--	--	na	1.5E+05	--	--	na	**1.5E+05**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.7E+06	--	--	na	5.3E+02	--	--	na	1.7E+05	--	--	na	**1.7E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	9.1E+04	--	--	na	2.8E+01	--	--	na	9.1E+03	--	--	na	**9.1E+03**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	4.3E+04	--	--	na	3.4E+00	--	--	na	4.3E+03	--	--	na	**4.3E+03**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.7E-05	--	--	na	5.1E-09	--	--	na	1.7E-06	--	--	na	**1.7E-06**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.5E+03	--	--	na	2.0E-01	--	--	na	2.5E+02	--	--	na	**2.5E+02**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	9.3E-01	4.8E+00	na	2.9E+04	5.5E-02	1.4E-02	na	8.9E+00	4.0E+00	1.2E+00	na	2.9E+03	**9.3E-01**	**1.2E+00**	na	**2.9E+03**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	9.3E-01	4.8E+00	na	2.9E+04	5.5E-02	1.4E-02	na	8.9E+00	4.0E+00	1.2E+00	na	2.9E+03	**9.3E-01**	**1.2E+00**	na	**2.9E+03**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	9.3E-01	4.8E+00	--	--	5.5E-02	1.4E-02	--	--	4.0E+00	1.2E+00	--	--	**9.3E-01**	**1.2E+00**	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	2.9E+04	--	--	na	8.9E+00	--	--	na	2.9E+03	--	--	na	**2.9E+03**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	3.6E-01	3.1E+00	na	2.0E+01	2.2E-02	9.0E-03	na	6.0E-03	1.5E+00	7.7E-01	na	2.0E+00	**3.6E-01**	**7.7E-01**	na	**2.0E+00**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	9.8E+01	--	--	na	3.0E-02	--	--	na	9.8E+00	--	--	na	**9.8E+00**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
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Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	6.8E+05	--	--	na	2.1E+02	--	--	na	6.8E+04	--	--	na	6.8E+04
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	4.6E+04	--	--	na	1.4E+01	--	--	na	4.6E+03	--	--	na	4.6E+03
Fluorene	0	--	--	na	5.3E+03	--	--	na	1.7E+06	--	--	na	5.3E+02	--	--	na	1.7E+05	--	--	na	1.7E+05
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	8.5E-01	na	--	--	2.5E-03	na	--	--	2.1E-01	na	--	--	2.1E-01	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	2.2E+00	3.2E-01	na	1.0E+00	1.3E-01	9.5E-04	na	7.9E-05	9.4E+00	8.1E-02	na	1.0E-01	2.2E+00	8.1E-02	na	1.0E-01
Heptachlor Epoxide [C]	0	5.2E-01	3.8E-03	na	3.9E-04	2.2E+00	3.2E-01	na	4.9E-01	1.3E-01	9.5E-04	na	3.9E-05	9.4E+00	8.1E-02	na	4.9E-02	2.2E+00	8.1E-02	na	4.9E-02
Hexachlorobenzene [C]	0	--	--	na	2.9E-03	--	--	na	3.7E+00	--	--	na	2.9E-04	--	--	na	3.7E-01	--	--	na	3.7E-01
Hexachlorobutadiene [C]	0	--	--	na	1.8E+02	--	--	na	2.3E+05	--	--	na	1.8E+01	--	--	na	2.3E+04	--	--	na	2.3E+04
Hexachlorocyclohexane Alpha-BHC [C]	0	--	--	na	4.9E-02	--	--	na	6.2E+01	--	--	na	4.9E-03	--	--	na	6.2E+00	--	--	na	6.2E+00
Hexachlorocyclohexane Beta-BHC [C]	0	--	--	na	1.7E-01	--	--	na	2.1E+02	--	--	na	1.7E-02	--	--	na	2.1E+01	--	--	na	2.1E+01
Hexachlorocyclohexane Gamma-BHC [C] (Lindane)	0	9.5E-01	na	na	1.8E+00	4.0E+00	--	na	2.3E+03	2.4E-01	--	na	1.8E-01	1.7E+01	--	na	2.3E+02	4.0E+00	--	na	2.3E+02
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	3.6E+05	--	--	na	1.1E+02	--	--	na	3.6E+04	--	--	na	3.6E+04
Hexachloroethane [C]	0	--	--	na	3.3E+01	--	--	na	4.2E+04	--	--	na	3.3E+00	--	--	na	4.2E+03	--	--	na	4.2E+03
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.7E+02	na	--	--	5.0E-01	na	--	--	4.3E+01	na	--	--	4.3E+01	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	2.3E+02	--	--	na	1.8E-02	--	--	na	2.3E+01	--	--	na	2.3E+01
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Isophorone [C]	0	--	--	na	9.6E+03	--	--	na	1.2E+07	--	--	na	9.6E+02	--	--	na	1.2E+06	--	--	na	1.2E+06
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--
Lead	0	4.4E+01	4.8E+00	na	--	1.8E+02	4.1E+02	na	--	1.1E+01	1.2E+00	na	--	7.6E+02	1.0E+02	na	--	1.8E+02	1.0E+02	na	--
Malathion	0	--	1.0E-01	na	--	--	8.5E+00	na	--	--	2.5E-02	na	--	--	2.1E+00	na	--	--	2.1E+00	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	5.9E+00	6.5E+01	--	--	3.5E-01	1.9E-01	--	--	2.5E+01	1.6E+01	--	--	5.9E+00	1.6E+01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	4.9E+05	--	--	na	1.5E+02	--	--	na	4.9E+04	--	--	na	4.9E+04
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	7.4E+06	--	--	na	5.9E+02	--	--	na	7.4E+05	--	--	na	7.4E+05
Methoxychlor	0	--	3.0E-02	na	--	--	2.6E+00	na	--	--	7.5E-03	na	--	--	6.4E-01	na	--	--	6.4E-01	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--
Nickel	0	9.4E+01	1.0E+01	na	4.6E+03	4.0E+02	8.6E+02	na	1.5E+06	2.3E+01	2.5E+00	na	4.6E+02	1.6E+03	2.2E+02	na	1.5E+05	4.0E+02	2.2E+02	na	1.5E+05
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	2.2E+05	--	--	na	6.9E+01	--	--	na	2.2E+04	--	--	na	2.2E+04
N-Nitrosodimethylamine [C]	0	--	--	na	3.0E+01	--	--	na	3.8E+04	--	--	na	3.0E+00	--	--	na	3.8E+03	--	--	na	3.8E+03
N-Nitrosodiphenylamine [C]	0	--	--	na	6.0E+01	--	--	na	7.6E+04	--	--	na	6.0E+00	--	--	na	7.6E+03	--	--	na	7.6E+03
N-Nitrosodi-n-propylamine [C]	0	--	--	na	5.1E+00	--	--	na	6.4E+03	--	--	na	5.1E-01	--	--	na	6.4E+02	--	--	na	6.4E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.2E+02	5.6E+02	na	--	7.0E+00	1.7E+00	--	--	5.0E+02	1.4E+02	--	--	1.2E+02	1.4E+02	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	2.7E-01	1.1E+00	na	--	1.6E-02	3.3E-03	na	--	1.2E+00	2.8E-01	na	--	2.7E-01	2.8E-01	na	--
PCB Total [C]	0	--	1.4E-02	na	6.4E-04	--	1.2E+00	na	8.1E-01	--	3.5E-03	na	6.4E-05	--	3.0E-01	na	8.1E-02	--	3.0E-01	na	8.1E-02
Pentachlorophenol [C]	0	4.3E+00	3.0E+00	na	3.0E+01	1.8E+01	2.6E+02	na	3.8E+04	9.8E-01	7.5E-01	na	3.0E+00	7.1E+01	6.4E+01	na	3.8E+03	1.8E+01	6.4E+01	na	3.8E+03
Phenol	0	--	--	na	8.6E+05	--	--	na	2.8E+08	--	--	na	8.6E+04	--	--	na	2.8E+07	--	--	na	2.8E+07
Pyrene	0	--	--	na	4.0E+03	--	--	na	1.3E+06	--	--	na	4.0E+02	--	--	na	1.3E+05	--	--	na	1.3E+05
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	8.5E+01	4.3E+02	na	1.4E+06	5.0E+00	1.3E+00	na	4.2E+02	3.6E+02	1.1E+02	na	1.4E+05	**8.5E+01**	**1.1E+02**	**na**	**1.4E+05**
Silver	0	8.9E-01	--	na	--	3.8E+00	--	na	--	2.1E-01	--	na	--	1.5E+01	--	na	--	**3.8E+00**	--	**na**	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	5.0E+04	--	--	na	4.0E+00	--	--	na	5.0E+03	--	--	**na**	**5.0E+03**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	4.2E+04	--	--	na	3.3E+00	--	--	na	4.2E+03	--	--	**na**	**4.2E+03**
Thallium	0	--	--	na	4.7E-01	--	--	na	1.5E+02	--	--	na	4.7E-02	--	--	na	1.5E+01	--	--	**na**	**1.5E+01**
Toluene	0	--	--	na	6.0E+03	--	--	na	2.0E+06	--	--	na	6.0E+02	--	--	na	2.0E+05	--	--	**na**	**2.0E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	3.1E+00	1.7E-02	na	3.5E+00	1.8E-01	5.0E-05	na	2.8E-04	1.3E+01	4.3E-03	na	3.5E-01	**3.1E+00**	**4.3E-03**	**na**	**3.5E-01**
Tributyltin	0	4.6E-01	7.2E-02	na	--	1.9E+00	6.1E+00	na	--	1.2E-01	1.8E-02	na	--	8.3E+00	1.5E+00	na	--	**1.9E+00**	**1.5E+00**	**na**	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	2.3E+04	--	--	na	7.0E+00	--	--	na	2.3E+03	--	--	**na**	**2.3E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	2.0E+05	--	--	na	1.6E+01	--	--	na	2.0E+04	--	--	**na**	**2.0E+04**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.8E+05	--	--	na	3.0E+01	--	--	na	3.8E+04	--	--	**na**	**3.8E+04**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	3.0E+04	--	--	na	2.4E+00	--	--	na	3.0E+03	--	--	**na**	**3.0E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	3.0E+04	--	--	na	2.4E+00	--	--	na	3.0E+03	--	--	**na**	**3.0E+03**
Zinc	0	6.0E+01	5.9E+01	na	2.6E+04	2.5E+02	5.0E+03	na	8.5E+06	1.5E+01	1.5E+01	na	2.6E+03	1.1E+03	1.3E+03	na	8.5E+05	**2.5E+02**	**1.3E+03**	**na**	**8.5E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.1E+04
Arsenic	5.8E+02
Barium	na
Cadmium	2.7E+00
Chromium III	4.8E+02
Chromium VI	2.7E+01
Copper	1.1E+01
Iron	na
Lead	6.1E+01
Manganese	na
Mercury	2.4E+00
Nickel	1.3E+02
Selenium	3.4E+01
Silver	1.5E+00
Zinc	1.0E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

0.020 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGI 0.020

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.065	7.029	0.085	7.049
7Q10	1.680	N/A	1.700	N/A
30Q10	3.600	30.400	3.620	30.420
30Q5	6.500	N/A	6.520	N/A
Harm. Mean	25.200	N/A	25.220	N/A
Annual Avg.	0.000	N/A	0.020	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	24.227	14.758
30Q10 90th% Temp. Mix (deg C)	23.419	14.790
1Q10 90th% pH Mix (SU)	7.110	7.001
30Q10 90th% pH Mix (SU)	7.002	7.000
1Q10 10th% pH Mix (SU)	6.307	N/A
7Q10 10th% pH Mix (SU)	6.205	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	45.6	45.6
7Q10 Hardness (mg/L as CaCO3)	44.3	44.3

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.110
(7.204 - pH)	0.094
(pH - 7.204)	-0.094
Trout Present Criterion (mg N/I	21.715
Trout Absent Criterion (mg N/L	32.517
Trout Present?	n
Effective Criterion (mg N/L)	32.517

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	23.419
90th Percentile pH (SU)	7.002
MIN	1.606
MAX	23.419
(7.688 - pH)	0.686
(pH - 7.688)	-0.686
Early LS Present Criterion (mg N	3.326
Early LS Absent Criterion (mg N/	3.326
Early Life Stages Present?	y
Effective Criterion (mg N/L)	3.326

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.001
(7.204 - pH)	0.203
(pH - 7.204)	-0.203
Trout Present Criterion (mg N/I	24.078
Trout Absent Criterion (mg N/L	36.056
Trout Present?	n
Effective Criterion (mg N/L)	36.056

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	14.790
90th Percentile pH (SU)	7.000
MIN	2.801
MAX	14.790
(7.688 - pH)	0.688
(pH - 7.688)	-0.688
Early LS Present Criterion (mg N	5.806
Early LS Absent Criterion (mg N/	5.806
Early Life Stages Present?	y
Effective Criterion (mg N/L)	5.806

0.020 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI 0.020

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	1.420	16.800	1.440	16.820
7Q10	1.680	N/A	1.700	N/A
30Q10	3.600	30.400	3.620	30.420
30Q5	6.500	N/A	6.520	N/A
Harm. Mean	25.200	N/A	25.220	N/A
Annual Avg.	0.000	N/A	0.020	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	23.449	14.782
30Q10 90th% Temp. Mix (deg C)	23.419	14.790
1Q10 90th% pH Mix (SU)	7.006	7.000
30Q10 90th% pH Mix (SU)	7.002	7.000
1Q10 10th% pH Mix (SU)	6.206	N/A
7Q10 10th% pH Mix (SU)	6.205	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	44.281	44.281
7Q10 Hardness (mg/L as CaCO3) =	44.268	44.268

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.006
(7.204 - pH)	0.198
(pH - 7.204)	-0.198
Trout Present Criterion (mg N/I	23.981
Trout Absent Criterion (mg N/L	35.910
Trout Present?	n
Effective Criterion (mg N/L)	35.910

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	23.419
90th Percentile pH (SU)	7.002
MIN	1.606
MAX	23.419
(7.688 - pH)	0.686
(pH - 7.688)	-0.686
Early LS Present Criterion (mg N	3.326
Early LS Absent Criterion (mg N/	3.326
Early Life Stages Present?	y
Effective Criterion (mg N/L)	3.326

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.000
(7.204 - pH)	0.204
(pH - 7.204)	-0.204
Trout Present Criterion (mg N/I	24.093
Trout Absent Criterion (mg N/L	36.077
Trout Present?	n
Effective Criterion (mg N/L)	36.077

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	14.790
90th Percentile pH (SU)	7.000
MIN	2.801
MAX	14.790
(7.688 - pH)	0.688
(pH - 7.688)	-0.688
Early LS Present Criterion (mg N	5.806
Early LS Absent Criterion (mg N/	5.806
Early Life Stages Present?	y
Effective Criterion (mg N/L)	5.806

Fauquier Springs Country Club Effluent Data November 2011 through October 2013

Month/ Year	Day	Temp °C	pH
Nov-11	1	17.6	7.5
	2	16.9	7.5
	3	17.3	7.5
	4	18.3	7.0
	5	16.7	7.5
	6	17.3	7.5
	7	17.0	7.5
	8	17.3	7.5
	9	18.1	7.5
	10	17.1	7..0
	11	17.3	7.5
	12	16.5	7.5
	13	17.7	7.5
	14	18.5	7.5
	15	18.2	7.5
	16	18.8	7.5
	17	18.3	7.0
	18	17.1	7.5
	19	17.7	7.2
	20	16.7	7.0
	21	17.5	7.5
	22	17.8	7.5
	23	17.8	7.5
	24	17.5	7.5
	25	16.4	7.5
	26	17.4	7.0
	27	18.5	7.0
	28	17.5	7.3
	29	17.4	7.5
	30	17.0	7.5
Dec-11	1	16.5	7.5
	2	15.7	7.5
	3	15.7	7.5
	4	15.7	7.5
	5	17.0	7.5
	6	17.1	7.5
	7	17.5	7.5
	8	17.0	7.5
	9	15.9	7.5
	10	13.7	7.0
	11	13.1	7.5
	12	12.0	7.5
	13	11.2	7.5
	14	10.9	7.3
	15	12.7	7.0
	16	13.2	7.5
	17	12.1	7.5
	18	12.0	7.0
	19	12.6	7.5
	20	10.5	7.3
	21	11.3	7.5
	22	11.6	7.5
	23	12.0	7.5
	24	11.7	7.5
	25	10.7	7.0
	26	8.9	7.5
	27	8.3	7.5
	28	8.9	7.5
	29	8.7	7.0
	30	9.7	7.0
	31	4.7	7.0
Jan-12	1	3.3	7.5
	2	9.9	7.5
	3	8.1	7.0
	4	6.7	7.0
	5	7.0	7.5
	6	7.1	7.3
	7	8.9	7.6
	8	7.5	7.7
	9	10.6	7.6
	10	10.7	7.7
	11	7.9	7.5
	12	9.1	7.3
	13	9.6	7.5
	14	4.7	7.6
	15	4.4	7.5
	16	10.4	7.7
	17	10.2	7.2
	18	10.3	7.6
	19	8.9	7.5
	20	8.6	7.5
	21	7.9	7.4
	22	11.6	7.4
	23	9.1	7.4
	24	11.2	7.3
	25	10.2	7.4
	26	10.1	7.3
	27	12.5	7.4
	28	9.8	7.3
	29	7.1	7.4
	30	12.6	7.4
	31	12.4	7.4
Feb-12	1	13.2	7.3
	2	13.4	7.3
	3	13.0	7.4
	4	10.5	7.3
	5	13.3	7.3
	6	12.9	7.3
	7	11.8	7.4
	8	11.6	7.3
	9	10.1	7.4
	10	10.3	7.6
	11	10.7	7.4
	12	5.1	7.3
	13	10.1	7.5
	14	10.4	7.6
	15	11.6	7.4
	16	12.4	7.4
	17	13.0	7.3
	18	13.4	7.5
	19	13.4	7.5
	20	13.5	7.5
	21	12.9	7.6
	22	12.7	7.6
	23	12.9	7.3
	24	13.8	7.4
	25	12.7	7.3
	26	13.7	7.3
	27	15.4	7.5
	28	15.0	7.5
	29	13.9	7.6
Mar-12	1	14.1	7.5
	2	13.9	7.4
	3	14.2	7.2
	4	14.4	7.1
	5	13.8	7.3
	6	12.1	7.2
	7	12.4	7.5
	8	13.3	7.4
	9	14.8	7.3
	10	7.5	7.3
	11	7.3	7.3
	12	15.0	7.3
	13	15.7	7.2
	14	17.3	7.2

Attachment 6

Month/ Year	Day	Temp °C	pH
	15	18.1	7.1
	16	18.6	7.2
	17	20.1	7.1
	18	20.8	7.1
	19	18.4	7.4
	20	19.6	7.3
	21	18.8.	7.3
	22	18.7	7.2
	23	19.5	7.4
	24	14.7	7.2
	25	13.5	7.3
	26	20.1	7.3
	27	18.7	7.3
	28	18.5	7.2
	29	18.4	7.4
	30	18.3	7.3
	31	16.1	7.3
Apr-12	1	16.7	7.2
	2	20.0	7.2
	3	18.6	7.4
	4	18.9	7.3
	5	18.5	7.2
	6	18.3	7.3
	7	16.7	7.5
	8	17.3	7.3
	9	17.8	7.2
	10	18.8	7.4
	11	18.2	7.5
	12	18.1	7.4
	13	18.0	7.5
	14	8.9	7.8
	15	12.6	7.5
	16	19.8	7.2
	17	20.3	7.9
	18	19.4	8.2
	19	19.8	7.7
	20	19.8	8.1
	21	20.4	8.0
	22	18.5	8.5
	23	18.6	8.5
	24	18.8	8.1
	25	18.8	8.0
	26	18.6	8.5
	27	19.4	8.1
	28	10.1	8.0
	29	10.5	7.9
	30	19.8	8.0

Month/ Year	Day	Temp °C	pH
May-12	1	20..3	7.4
	2	21.8	8.0
	3	22.1	7.3
	4	22.9	8.1
	5	22.5	7.9
	6	22.6	8.5
	7	22.5	8.3
	8	22.4	8.2
	9	22.8	7.5
	10	22.0	7.7
	11	21.7	8.1
	12	9.5	7.7
	13	16.8	7.7
	14	23.1	8.4
	15	23.3	7.5
	16	23.8	7.6
	17	22.7	8.4
	18	22.1	7.7
	19	20.8	8.5
	20	22.7	8.2
	21	23.4	8.1
	22	23.4	7.8
	23	23.2	7.9
	24	23.1	7.8
	25	23.6	8.3
	26	22.7	7.8
	27	23.2	7.7
	28	24.8	8.1
	29	24.9	7.9
	30	25.1	8.0
	31	25.3	8.0
Jun-12	1	25.1	8.1
	2	21.8	7.5
	3	24.0	7.7
	4	23.5	7.9
	5	18.0	9.3
	6	23.3	8.2
	7	20.9	8.2
	8	23.6	8.2
	9	22.4	8.1
	10	24.8	8.5
	11	25.1	8.2
	12	23.0	8.3
	13	25.5	8.1
	14	24.8	8.4
	15	23.8	7.9
	16	23.5	7.8

Month/ Year	Day	Temp °C	pH
	17	22.8	8.0
	18	25.0	8.0
	19	25.1	8.0
	20	26.5	8.1
	21	26.3	7.7
	22	26.9	7.8
	23	25.8	8.2
	24	26.6	7.8
	25	26.2	8.0
	26	25.9	7.8
	27	26.0	7.4
	28	25.9	7.9
	29	26.7	8.3
	30		
Jul-12	1	27.8	7.4
	2	25.5	8.2
	3	26.8	8.7
	4	26.1	8.4
	5	27.9	8.6
	6	28.0	8.3
	7	28.1	8.8
	8	29.2	8.7
	9	27.6	8.4
	10	26.8	8.2
	11	26.2	8.1
	12	27.5	8.3
	13	27.3	7.7
	14	27.6	8.3
	15	27.4	8.2
	16	25.7	8.2
	17	28.3	8..1
	18	27.7	8..1
	19	28.0	8.1
	20	28.1	8.2
	21	27.2	8.6
	22	27.3	8.6
	23	27.7	8.1
	24	28.2	8.3
	25	27.4	8.4
	26	27.3	7.9
	27	27.7	8.0
	28	27.0	8.4
	29	27.2	8.2
	30	27.5	8.2
	31	27.7	7.0
Aug-12	1	27.6	8.6
	2	27.4	8.4

Month/ Year	Day	Temp °C	pH
	3	27.9	8.5
	4	27.7	8.3
	5	27.6	8.3
	6	28.1	8.5
	7	28.3	8.5
	8	28.0	8.2
	9	27.8	8.0
	10	27.7	8.2
	11	27.4	8.0
	12	27.3	8.2
	13	27.9	8.5
	14	27.2	8.4
	15	27.4	8.4
	16	27.0	8.2
	17	27.2	8.2
	18	26.9	9.0
	19	26.8	8.1
	20	26.7	8.1
	21	26.3	8.1
	22	26.1	8.3
	8.3		
	24	25.6	8.3
	25	26.3	8.4
	26	26.5	8.5
	27	27.3	8.5
	28	27.0	8.3
	29	26.7	8.4
	30	27.2	8.0
	31	27.0	8.3
Sep-12	1	27.8	8.4
	2	26.7	8.0
	3	27.5	7.9
	4	26.8	7.8
	5	27.6	8.0
	6	27.5	8.2
	7	27.4	8.1
	8	27.4	8.1
	9	26.6	8.1
	10	25.9	8.1
	11	23.5	8.4
	12		
	13	25.0	8.0
	14	24.4	7.9
	15	25.0	7.9
	16	23.8	8.4
	17	24.9	8.3
	18	25.1	8.1

Month/ Year	Day	Temp °C	pH
	19	25.5	8.1
	20	24.2	8.1
	21	23.5	7.9
	22	25.1	8.0
	23	24.2	8.2
	24	23.7	8.2
	25	22.8	8.1
	26	23.4	8.0
	27	24.0	8.1
	28	24.5	8.2
	29	24.3	8.2
	30	24.0	8.2
Oct-12	1	24.0	8.3
	2	23.7	8.2
	3	24.2	8.1
	4	24.5	7.7
	5	22.9	8.1
	6	24.6	7.8
	7	23.2	8.3
	8	22.3	8.3
	9	22.3	7.7
	10	22.8	8.1
	11	21.1	7.8
	12	21.1	8.1
	13	21.0	7.8
	14	21.7	7.9
	15	22.1	7.9
	16	21.1	8.1
	17	20.5	7.9
	18	21.2	8.4
	19	21.4	8.0
	20	21.1	8.1
	21	21.3	8.1
	22	21.3	8.4
	23	21.0	8.2
	24	21.8	8.6
	25	21.5	8.0
	26	22.0	8.1
	27	22.0	8.1
	28	22.2	7.9
	29	20.0	8.1
	30	15.9	7.2
	31	17.1	8.1
Nov-12	1	17.6	7.5
	2	16.9	7.5
	3	17.3	7.5
	4	18.3	7.0

Month/ Year	Day	Temp °C	pH
	5	16.7	7.5
	6	17.3	7.5
	7	17.0	7.5
	8	17.3	7.5
	9	18.1	7.5
	10	17.1	7.0
	11	17.3	7.5
	12	16.5	7.5
	13	17.7	7.5
	14	18.5	7.5
	15	18.2	7.5
	16	18.8	7.5
	17	18.3	7.0
	18	17.1	7.5
	19	17.7	7.2
	20	16.7	7.0
	21	17.5	7.5
	22	17.8	7.5
	23	17.8	7.5
	24	17.5	7.5
	25	16.4	7.5
	26	17.4	7.0
	27	18.5	7.0
	28	17.5	7.3
	29	17.4	7.5
	30	17.0	7.5
Dec-12	1	13.7	8.1
	2	13.7	8.2
	3	16.2	8.4
	4	16.8	8.4
	5	16.5	8.3
	6	15.6	8.4
	7	15.9	8.5
	8	16.8	8.3
	9	17.8	8.0
	10	16.8	8.2
	11	16.4	8.3
	12	16.2	8.1
	13	15.4	8.3
	14	14.8	8.0
	15	14.0	8.2
	16	15.2	8.1
	17	15.9	8.3
	18	16.2	8.3
	19	15.7	8..2
	20	15.0	8.2
	21	15.2	8.0

Month/ Year	Day	Temp °C	pH
	22	14.6	8.2
	23	13.2	8.4
	24	13.4	8.0
	25	13.7	8.0
	26	13.0	7.9
	27	12.3	8.2
	28	12.0	8.0
	29	11.8	8.1
	30	10.9	8.1
	31	10.3	7.9
Jan-13	1	10.3	7.9
	2	10.6	7.9
	3	9.9	7.9
	4		
	5	8.1	7.5
	6	9.4	7.8
	7	10.8	7.8
	8	10.9	7.8
	9	10.2	7.8
	10	10.7	7.9
	11	11.6	8.1
	12	12.2	8.2
	13	13.8	8.2
	14	15.0	7.9
	15	13.6	8.4
	16	13.6	7.9
	17	13.6	7.9
	18	11.9	8.0
	19	11.5	8.1
	20	11.9	8.1
	21	12.5	7.9
	22	11.7	8.0
	23	10.7	7.8
	24	10.8	7.7
	25	10.1	8.1
	26	10.1	7.9
	27	10.4	7.6
	28	10.8	7.8
	29	11.5	7.8
	30	12.9	8.0
	31	13.0	7.6
Feb-13	1	11.9	8.1
	2	11.0	8.0
	3	11.5	8.3
	4	10.7	8.1
	5	10.9	7.6
	6	11.2	7.8

Month/ Year	Day	Temp °C	pH
	7	11.6	7.9
	8	12.2	8.0
	9	11.6	7.7
	10	10.7	8.3
	11	12.4	8.2
	12	12.9	8.1
	13	12.1	7.7
	14	11.1	8.2
	15	12.2	8.2
	16	12.9	8.1
	17	11.8	8.1
	18	11.2	8.1
	19	11.0	7.6
	20	11.3	7.7
	21	10.9	7.9
	22	10.9	8.1
	23	11.4	7.9
	24	12.3	7.8
	25	11.7	8.3
	26	11.9	8.0
	27	12.0	8.0
	28	12.3	7.7
Mar-13	1	12.2	8.2
	2	12.3	8.1
	3	11.9	7.7
	4	11.5	8.3
	5	12.2	7.7
	6	9.8	8.2
	7	11.1	7.6
	8	10.9	7.8
	9	11.0	8.1
	10	12.0	7.7
	11	13.1	7.4
	12	13.7	7.5
	13	13.4	7.5
	14	13.4	7.4
	15	12.5	8.1
	16	13.1	7.8
	17	14.2	7.7
	18	13.6	7.7
	19	13.4	7.6
	20	13.4	7.5
	21	13.4	7.7
	22	12.6	7.7
	23	12.9	7.2
	24	13.3	7.7
	25	13.4	8.5

Month/ Year	Day	Temp °C	pH
	26	13.3	7.7
	27	12.8	7.8
	28	12.9	7.6
	29	13.2	7.7
	30	13.0	7.6
	31	13.1	7.6
Apr-13	1	14.8	7.8
	2	13.7	7.3
	3		
	4	13.3	7.0
	5	14.7	7.7
	6	13.9	7.4
	7	14.4	7.7
	8	15.8	7.8
	9	16.8	7.7
	10	18.7	7.4
	11	19.2	6.9
	12	19.2	7.4
	13	19.2	7.3
	14	18.9	7.2
	15	18.5	8.7
	16	19.1	7.1
	17	20.0	7.6
	18	19.9	7.5
	19	20.3	7.8
	20	19.8	8.0
	21	18.7	7.8
	22	18.1	7.9
	23	18.4	7.6
	24	19.1	7.8
	25	18.5	7.8
	26	19.0	7.4
	27	19.0	7.7
	28	19.4	7.9
	29	18.5	8.0
	30	19.6	7.9
May-13	1	19.9	7.7
	2	19.9	7.1
	3	19.8	7.5
	4	19.6	7.3
	5	19.8	7.6
	6	20.1	7.4
	7	20.3	6.8
	8	20.4	6.8
	9	19.9	7.3
	10	20.4	7.3
	11	21.5	7.6

Month/ Year	Day	Temp °C	pH
	12	21.3	7.7
	13		
	14	20.7	7.6
	15	20.2	7.5
	16	21.4	7.4
	17	22.0	7.2
	18	22.1	7.3
	19	22.1	7.3
	20	22.8	7.1
	21	23.1	7.7
	22	24.0	7.5
	23	24.3	7.4
	24	23.1	7.4
	25	21.2	8.0
	26	21.4	8.1
	27	21.1	7.7
	28	21.9	7.5
	29	22.4	7.6
	30	23.6	7.5
	31	24.2	8.3
Jun-13	1	24.4	7.7
	2	24.8	7.7
	3	24.7	7.2
	4	24.3	8.0
	5	24.2	8.0
	6	23.5	8.1
	7	23.2	7.9
	8	23.4	8.1
	9	23.7	7.8
	10	23.6	7.7
	11	24.2	7.5
	12	24.5	7.4
	13	24.6	7.7
	14	23.6	7.6
	15	24.5	7.8
	16	24.8	7.7
	17	24.5	7.8
	18	24.7	7.8
	19	24.6	8.2
	20	24.8	8.0
	21	24.4	8.0
	22	24.6	7.9
	23	25.3	7.6
	24	26.3	7.7
	25	26.9	8.1
	26	26.7	7.7
	27	26.1	7.7

Month/ Year	Day	Temp °C	pH
	28	26.0	7.6
	29	25.7	7.7
	30	26.2	7.6
Jul-13	1	26.3	7.4
	2	26.7	7.7
	3	26.2	7.7
	4	26.6	7.7
	5	26.4	8.3
	6	27.5	8.1
	7	27.2	7.8
	8	26.7	7.8
	9	27.6	8.3
	10	27.2	7.8
	11	27.4	7.7
	12	26.1	7.7
	13	26.4	8.0
	14	26.8	8.0
	15	26.3	7.7
	16	27.6	7.9
	17	26.5	7.7
	18	28.2	7.8
	19	28.0	8.0
	20	28.1	7.9
	21	28.0	7.9
	22	27.2	7.9
	23	27.9	7.9
	24	27.4	7.8
	25	27.0	8.3
	26	26.0	8.0
	27	26.3	7.7
	28	26.3	8.0
	29	26.2	7.6
	30	26.3	7.5
	31	26.0	7.9
Aug-13	1	26.5	8.0
	2	25.8	7.9
	3	26.3	8.0
	4	26.1	8.2
	5	25.7	8.3
	6	25.9	8.0
	7	26.3	8.0
	8	26.4	8.1
	9	26.3	8.0
	10	27.0	8.0
	11	26.9	8.3
	12	22.1	7.9
	13	27.0	8.3

Month/ Year	Day	Temp °C	pH
	14	26.6	7.9
	15	25.7	8.3
	16	24.9	8.4
	17	25.2	8.5
	18	25.0	8.4
	19	25.2	7.6
	20	25.8	8.3
	21	26.4	8.0
	22	26.5	7.9
	23	25.8	8.4
	24	25.4	8.1
	25	25.1	8.4
	26	24.8	8.4
	27	26.3	8.3
	28	26.2	8.3
	29	26.0	8.1
	30	26.0	8.3
	31	26.5	8.3
Sep-13	1	26.8	8.3
	2	27.0	7.9
	3	27.3	8.4
	4	26.9	8.0
	5	26.4	8.1
	6	25.6	8.1
	7	25.0	8.4
	8	25.5	8.3
	9	25.6	8.1
	10	26.7	8.0
	11	27.4	8.5
	12	26.8	8.3
	13	26.1	8.2
	14	24.9	8.5
	15	24.4	8.4
	16	24.0	8.3
	17	24.0	8.3
	18	23.5	8.1
	19	23.4	8.2
	20	22.9	8.3
	21	23.7	8.1
	22	23.6	8.1
	23	23..4	8.3
	24	22.9	8.1
	25		
	26	22.6	8.1
	27	22.4	8.0
	28	22.7	8.2
	29	22.6	8.0

Month/ Year	Day	Temp °C	pH
	30	22.6	7.7
Oct-13	1	22.6	8.0
	2	23.6	8.1
	3	23.6	8.2
	4	22.7	8.1
	5	23.9	8.4
	6	24.0	7.5
	7	24.1	8.0
	8	22.6	8.0
	9	22.7	8.1
	10	21.5	8.1
	11	21.4	8.2
	12	22.0	8.1
	13	22.0	8.1
	14	22.6	8.0
	15	22.3	7.9
	16	22.7	8.3
	17	22.9	8.0
	18	21.8	8.0
	19	21.7	7.9
	20	21.5	8.1
	21	20.9	7.9
	22	20.7	8.2
	23	19.2	8.3
	24	19.4	8.2
	25	18.1	8.4
	26	18.4	8.3
	27	18.7	8.3
	28	17.5	8.5
	29	18.8	8.1
	30	18.9	8.3
	31	19.5	8.3

Temperature 90th Percentile = 26.9°C

pH 90th Percentile = 8.3 SU

pH 10th Percentile = 7.3 SU

Crowther, Joan (DEQ)

From:	Aschenbach, Ernie (DGIF)
Sent:	Thursday, August 22, 2013 4:16 PM
To:	Crowther, Joan (DEQ); nhreview (DCR); susan_lingenfelser@fws.gov; Daub, Elleanore (DEQ)
Cc:	ProjectReview (DGIF); Cason, Gladys (DGIF)
Subject:	ESSLog 34063; VPDES Permit# VA0077411 Re-issuance for the Fauquier Springs WWTP near Warrenton, VA

We have reviewed the VPDES re-issuance for the above-referenced facility. The receiving stream is the Rappahannock River. The current design flow of the facility is 0.01 MGD with plans to expand to 0.02 MGD under the new permit. The receiving stream has a low-flow 7Q10 of 1.7 million gallons per day (MGD), and high-flow 7Q10 of 21 MGD. The existing Ammonia as Nitrogen from (monthly-average) is 16 mg/L, and (weekly-average) is 16 mg/L. The proposed Ammonia as Nitrogen will remain the same. The total residual Chlorine (monthly-average) is 0.70 mg/L, and (weekly-average) is 0.090 mg/L (after dechlorination) and will remain the same under the new permit.

According to our records, the Rappahannock River is a designated Threatened and Endangered (T&E) species water for the state Threatened (ST) green floater mussel. It is also predicted habitat for the federal Endangered state Endangered (FESE) dwarf wedgemussel.

In order to protect aquatic resources, we generally recommend ultraviolet (UV) disinfection rather than chlorination disinfection. If chlorination becomes necessary and is used, we recommend and support continued dechlorination, prior to discharge. The ammonia limits proposed within the EPA rule are expressed on the basis of total ammonia-nitrogen (TAN). The proposed EPA ammonia limit for waters with mussels (not T&E mussels, any mussel species) is:

- CMC (Criterion Maximum Concentration or acute) - 2.9 mg N/L (at pH 8 and 25C)
- CCC (Criterion Continuous Concentration or chronic) - 0.26 mg N//L (at pH 8 and 25C) with a 4-day average within the 30 day average period no higher than 2.5 the CCC, which would be 0.65 mg N/L.

The ammonia limits proposed within the EPA rule are the best information currently available regarding ammonia levels protective of mussels. Therefore, we recommend and support the EPA values being implemented in this permit for this and all future VPDES permits.

This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend and support coordination with VDCR-DNH regarding the protection of these resources. We also recommend contacting the USFWS regarding all federally listed species.

Thank you for the opportunity to provide comments. Please call me if you have any questions.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
P.O. Box 11104
4010 West Broad Street
Richmond, VA 23230
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FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

Attachment 7

2014

Mixing Zone Predictions for Fauquier Springs 7Q10

Effluent Flow = .02 MGD
Stream 7Q10 = 1.68 MGD
Stream 30Q10 = 3.6 MGD
Stream 1Q10 = 1.42 MGD
Stream slope = 0.006 ft/ft
Stream width = 50 ft
Bottom scale = 1
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .1036 ft
Length = 34637.27 ft
Velocity = .5079 ft/sec
Residence Time = .7894 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .1633 ft
Length = 23678.67 ft
Velocity = .6865 ft/sec
Residence Time = .3992 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .0938 ft
Length = 37646.87 ft
Velocity = .4753 ft/sec
Residence Time = 22.0008 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 4.55% of the 1Q10 is used.

Attachment 8

2014

Mixing Zone Predictions for Fauquier Springs High Flows

Effluent Flow = .02 MGD
Stream 7Q10 = 21.3 MGD
Stream 30Q10 = 30.4 MGD
Stream 1Q10 = 16.8 MGD
Stream slope = .006 ft/ft
Stream width = 50 ft
Bottom scale = 1
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .4754 ft
Length = 9637.48 ft
Velocity = 1.3885 ft/sec
Residence Time = .0803 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .5894 ft
Length = 8032.53 ft
Velocity = 1.5978 ft/sec
Residence Time = .0582 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .4119 ft
Length = 10877.7 ft
Velocity = 1.2641 ft/sec
Residence Time = 2.3903 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 41.84% of the 1Q10 is used.

The Water Quality S iard requirement for Ammonia is endent on the stream's temperature and pH. he temperature and pH data used determine the Ammonia effluent limitations was collected at River Mile 147.1 on the Rappahannock River This is approximately 11.2 miles downstream from the discharge. This data was collected between July, 1968 and February, 1993. The temperature's 90th percentile is 25°C and the pH 90th percentile is 7.8 SU. See attached sheets for Total Ammonia Value Calculations.

ACUTE AMMONIA STANDARD FOR FRESHWATER: WARM WATER HABITATS, TROUT OR OTHER SENSITIVE COLDWATER SPECIES ABSENT, (TOTAL AMMONIA VALUE IS BASED ON THE WATER QUALITY STANDARDS (VR680-21-01.14.B):

TOTAL AMMONIA: 9.37 MG/L

$N\text{-}NH_3$: 9.37 x 0.824 = 7.7 MG/L

CHRONIC AMMONIA STANDARD FOR FRESHWATER: WARM WATER HABITATS, TROUT OR OTHER SENSITIVE COLDWATER SPECIES ABSENT, (TOTAL AMMONIA VALUE IS BASED ON THE WATER QUALITY STANDARDS (VR680-21-01.14.B):

TOTAL AMMONIA: 1.5 MG/L

$N\text{-}NH_3$: 1.5 x 0.824 = 1.24 MG/L

1993 Ammonia as N Calculation Documentation

FAUQUIER SPRINGS COUNTRY CLUB STP, VPDES PERMIT NO. VA0077411

CALCULATION FOR TOTAL AMMONIA VALUES AT DIFFERENT pH'S AND TEMPERATURE THAN LISTED IN THE WATER QUALITY STANDARDS (VR680-21-01.14B)

pH = 7.8 standard units
temperature = 25°C

THE ONE HOUR AVERAGE CONCENTRATION OF AMMONIA (IN MG/L AS UN-IONIZED NH_3) CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

Acute criteria concentration = 0.52/FT/FPH/2

where: FT = Final Temperature

$$FT = 10^{0.03(20 - TCAP)};\ TCAP < T < 30°C$$

TCAP = 25°C; when trout and other sensitive coldwater species are absent

$$FT = 10^{0.03(20 - 25)}$$

$$FT = 0.7079$$

where: FPH = Final pH

$$FPH = \frac{(1 + 10^{(7.4 - pH)})}{1.25};\ 6.5 < pH < 8.0$$

$$FPH = \frac{(1 + 10^{(7.4 - 7.8)})}{1.25}$$

FPH = 1.12

Therefore:

ACUTE CRITERIA CONCENTRATION = 0.52/0.7079/1.12/2 = 0.3279

CONVERSION FROM UN-IONIZED TO TOTAL AMMONIA CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

TOTAL AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

Where: Fraction of un-ionized ammonia = $1/(10^{pKa-pH} + 1)$

where: pKa = 0.09018 + (2729.92/(273.2 + temperature °C))
pKa = 9.24

Fraction of un-ionized ammonia = 0.035

THEREFORE: TOTAL ACUTE AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

TOTAL ACUTE AMMONIA CRITERIA = 0.3273/0.035 = 9.37 mg/l

CALCULATION FOR TOTAL AMMONIA VALUES AT DIFFERENT pH'S AND TEMPERATURE THAN LISTED IN THE WATER QUALITY STANDARDS (VR680-21-01.14B)

pH = 7.8 standard units
temperature = 25°C

THE 4-DAY AVERAGE CONCENTRATION OF AMMONIA (IN MG/L AS UN-IONIZED NH_3) CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

Chronic criteria concentration = 0.8/FT/FPH/RATIO

where: FT = Final Temperature

$$FT = 10^{0.03(20 - TCAP)};\ TCAP < T < 30°C$$

TCAP = 20°C; when trout and other sensitive coldwater species are absent

$$FT = 10^{0.03(20 - 20)}$$

$$FT = 1$$

where: FPH = Final pH

$$FPH = \frac{(1 + 10^{(7.4 - pH)})}{1.25};\ 6.5 < pH < 8.0$$

$$FPH = \frac{(1 + 10^{(7.4 - 7.8)})}{1.25}$$

FPH = 1.12

RATIO = 13.5; 7.7 < pH < 9

Therefore:

CHRONIC CRITERIA CONCENTRATION = 0.8/1/1.12/13.5 = 0.0529

CONVERSION FROM UN-IONIZED TO TOTAL AMMONIA CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

TOTAL CHRONIC AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

Where: Fraction of un-ionized ammonia = $1/(10^{pKa-pH} + 1)$

where: pKa = 0.09018 + (2729.92/(273.2 + temperature °C))
pKa = 9.24

Fraction of un-ionized ammonia = 0.035

THEREFORE: TOTAL CHRONIC AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

TOTAL CHRONIC AMMONIA CRITERIA = 0.0529/0.035 = 1.5 mg/l

THE INSTREAM WASTEWATER CONCENTRATION (IWC) CALCULATION: This calculation expresses the percentage of wastewater in the mix of wastewater and the receiving stream.

$$IWC\ \% = \frac{Q_e}{(Q_e + Q_s)}\ (100)$$

where:
Q_s = critical receiving stream flow
Q_e = design flow for facility

Definitions for types of critical receiving stream flow (Q_s):

1Q10 is the critical receiving stream flow used to determine acute aquatic life standard. 1Q10 is defined as the lowest steam flow which on a statistical basis, would occur for a 1-day period once every 10 years.

7Q10 is the critical receiving stream flow used to determine chronic aquatic life standard. 7Q10 is defined as the lowest steam flow which on a statistical basis, would occur for a 7-consecutive-day period once every 10 years.

30Q5 is the critical receiving stream flow used to determine non-carcinogenic human healt standards. 30Q5 is defined as the lowest stream flow which on a statistical basis, would occur for a 30-consecutive-day period once every 5 years.

The harmonic mean is the critical receiving stream flow used to determine carcinogenic human health standards. Harmonic mean is defined as the reciprocal of the arithmetic mea of the flow reciprocals.

The critical receiving stream flows for this discharge are as follows:

1Q10 = 1.42 MGD
7Q10 = 1.68 MGD
30Q5 = 6.2 MGD
Harmonic Mean = 25.2 MGD

$$Acute\ IWC = \frac{0.01743}{(0.01743 + 1.42)}(100) = 1.2\%$$

$$Chronic\ IWC = \frac{0.01743}{(0.01743 + 1.68)}(100) = 1.07\%$$

THE WASTELOAD ALLOCATION FOR AMMONIA:

$$WLA = \frac{C_o(Q_e + Q_s) - (C_s)(Q_s)}{Q_e}$$

where:
WLA = wasteload allocation
Q_s = critical receiving stream flow
Q_e = design flow
C_o = in stream standard
C_s = mean background concentration of parameter in stream

ACUTE WLA (WLA_a):

For stream dominated dischargers (defined as in IWC of 50% or less at critical

conditions), a steady state complete mix equation could result in a relatively large WLA_a. It is believed that discharges containing this large WLA_a could result in an introduction of concentrations of pollutants into the receiving stream that would not completely mix in a relatively rapid manner and may possibly cause lethality in the allocated impact zone. In order to ensure protection against lethality, the WLA_a for discharges into these stream dominated situations are set at 2 times the acute standard. The 2X factor is derived from the fact that the acute standard (or Criteria Maximum Concentration - CMC) is defined as one half of the final acute value (FAV) for a specific toxic pollutant. The term "final acute value" is defined as a cumulative probability of 0.05 for the acute toxicity values for all genera for which acceptable acute tests have been conducted with toxicant.

$$WLA_a = (7.7)(2) = 15.4 \ mg/l$$

CHRONIC WLA (WLA_c)

For stream dominated situations, a steady state complete mix with the whole 7Q10 is believed to be acceptable. This is because lethality in the allocated impact zone is addressed by the WLA_a so the zone of passage restrictions are the remaining restrictions to be addressed. It is believed that since the ratio of stream flow to effluent flow is relatively large, the effluent plume should not extend across the width of the stream prior to complete mix. This characteristic should allow the movement of passing or drifting organisms by the effluent plume, and it is assumed in accordance with VR680-21-01.4.a. that the complete mix is appropriate for addressing the spatial requirements.

$$WLA_c = \frac{C_o(Q_s + Q_e)}{Q_e} \qquad where \ C_s = 0.0 \ mg/l$$

$$WLA_c = \frac{1.24 \ (1.68 + 0.01743)}{0.01743}$$

$$WLA_c = 120.8 \ mg/l$$

Based on the above information, a computer program (attached) was utilized to develop the ammonia effluent limitations. The program uses methods described in Appendix E of the USEPA Technical Support Document for Water Quality Based Toxics Control, (1991). The ammonia effluent limitations for this discharge are:

Maximum Daily Limit: 15.4 mg/l

Average Monthly Limit: 15.4 mg/l

Analysis of the Fauquier Springs Country Club STP effluent data for Ammonia

The statistics for Ammonia are:

Number of values	=	1
Detection	=	.1 mg/l
Number < detection	=	0
Expected value	=	7.253759
Variance	=	18.94322
C.V.	=	.6
97th percentile	=	17.65175
Statistics used	=	Reasonable potential assumptions

The WLAs for Ammonia are:

Acute WLA	=	15.4 mg/l
Chronic WLA	=	120.8 mg/l
Human Health WLA	=	----

The limits are based on acute toxicity and 1 samples/month.

Maximum daily limit	=	15.4 mg/l
Average monthly limit	=	15.4 mg/l

DATA
6.22

TEMPERATURE AND pH FOR RAPPAHANNOCK RIVER AT RIVER MILE 147.1

Data from July, 1968 through February, 1993

Temperature	Sorted Temperature	pH	Sorted pH
27.8	29	7.5	9.2
25.6	28.3	7.8	9
20	28.3	6.5	9
15	28.2	6.5	8.7
3.3	28	6.8	8.7
20	27.8	6.5	8.4
22.2	27.8	6.5	8.33
2.8	27.7	6.8	8.2
8.3	27	6.7	8.1
13.3	27	6.8	8.1
20.6	26.7	7	8.1
23.9	26.5	6.8	8.1
22.8	26.5	6.8	8.1
17.2	26.4	9	8.1
3.9	26	6.2	8
3.3	26	6.5	8
4.4	26	7	8
7.2	26	7.5	8
13.3	26	7.5	8
13.9	25.7	7.5	8
17.8	25.6	7	8
25.6	25.6	7.8	7.9
22.2	25.6	7.7	7.9
16.7	25.6	7	7.9
21.1	25.5	7.1	7.8
7.8	25	9.2	7.8
8.9	25	6.8	7.8
6.1	25	7.7	7.8
2.2	24.7	6.8	7.7
11.1	24.7	6.5	7.7
10.6	24.4	7.1	7.7
17.8	24.2	7	7.7
21.1	24	7	7.7
25.6	24	7.2	7.7
22.8	23.9	7	7.7
17.2	23.9	6.7	7.7
16.1	23.9	7.2	7.7
9.4	23.8	6.8	7.7
5.6	23.5	7	7.7
6.7	23.5	7	7.6
3.9	23.5	6.8	7.6
12.2	23	6.7	7.6
8.9	23	6.8	7.6
17.8	22.8	7	7.6
27.8	22.8	7.2	7.6
22.2	22.7	7	7.6
17.2	22.7	7.2	7.6
8.3	22.5	7	7.6
10	22.2	6.5	7.6
6.7	22.2	5.9	7.6
1.7	22.2	7.5	7.55
14.4	22.2	7.2	7.5

90th Percentile for Temperature

251 values
251 x 0.9 = 225.9 = 226
Temperature 90th percentile = 25 C

90th Percentile for pH

246 values
246 x 0.9 = 221.4 = 221
pH 90th percentile = 7.8 su

09-Mar-93

FAUQUIER SPRINGS COUNTRY CLUB STP-VA0077411
EFFLUENT MONITORING DATA FOR AMMONIA AS NITROGEN
JANUARY 1994 TO APRIL 1998

DATE	AMMONIA
JANUARY 1994	12.4
FEBRUARY 1994	9.47
MARCH 1994	4.8
APRIL 1994	4.3
MAY 1994	8.4
JUNE 1994	11.1
JULY 1994	4.7
AUGUST 1994	6.5
SEPTEMBER 1994	10.6
OCTOBER 1994	10.7
NOVEMBER 1994	11.5
DECEMBER 1994	13.9
JANUARY 1995	15.6
FEBRUARY 1995	15.6
MARCH 1995	12.8
APRIL 1995	0.1
MAY 1995	14.4
JULY 1995	12.6
AUGUST 1995	7
SEPTEMBER 1995	6.4
OCTOBER 1995	5.7
NOVEMBER 1995	3.5
DECEMBER 1995	4.1
JANUARY 1996	2.9
FEBRUARY 1996	1.1
MARCH 1996	1
MARCH 1996	7.4
APRIL 1996	5.8
MAY 1996	8.7
JUNE 1996	7.1
JULY 1996	9.6
AUGUST 1996	10.9
SEPTEMBER 1996	1
OCTOBER 1996	0.5
NOVEMBER 1996	0.2
DECEMBER 1996	0.4
JANUARY 1997	0.1
FEBRUARY 1997	0.5
MARCH 1997	0.5
APRIL 1997	0.7

DATE	AMMONIA
MAY 1997	4.1
JUNE 1997	7.6
JULY 1997	13
AUGUST 1997	8.8
SEPTEMBER 1997	1
OCTOBER 1997	0.8
NOVEMBER 1997	0.4
DECEMBER 1997	2.2
JANUARY 1998	1.5
FEBRUARY 1998	3.6
MARCH 1998	3.1
APRIL 1998	3.5

Permit Limit Effective Date

Facility = Fauquier Springs CC STP (VA0077411)
Chemical = Ammonia as Nitrogen
Chronic averaging period = 30
WLAa = 15.6
WLAc = 37.8
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 15.6
Average Weekly limit = 15.6
Average Monthly Limit = 15.6

The data are:

9

Criteria and WLA Calculations for Ammonia based upon freshwater criteria (Nontidal Only)

Facility : Fauquier Springs Country Club STP
Permit Number : VA0077411
Comments : 3-RPP147.10 pH and Temp Data 1993-2003

pH	=	7.80	S.U.
Temperature	=	24.70	^{0}C
1Q10	=	1.422	MGD
7Q10	=	1.680	MGD
30Q5	=	6.14	MGD
Harmonic Mean	=	25.00	MGD
Design Flow	=	0.02	MGD
Percentage of 1Q10 by MIX.exe	=	9.27%	0.132 MGD
Percentage of 7Q10 by MIX.exe	=	100.00%	NA MGD
Water Body Tier	=	2	(1=No Antideg; 2= Antideg)

Final Temperature (FT) = $10^{(0.03)(20-T)}$
Final Temperature (FT) = 0.723

Final pH (FPH) = 1; where 8.0<pH<9.0
or = $(1+10^{(7.4-pH)})/1.25$; where 6.5<pH<8.0
Final pH (FPH) = 1.118

Calculated Unionized Ammonia = ((0.52/FT)/FPH)/2
Calculated Unionized Ammonia = 0.3216

pKa = 0.09018 + (2729.92/(273.2 + Temp.))
pKa = 9.254
Fraction of Unionized Ammonia = $1/(10^{(pKa-pH)}+1)$
Fraction of Unionized Ammonia = 0.0340

Total Acute Ammonia Criteria = 9.471 mg/l as NH_3
Total Acute Ammonia Criteria = 7.80 mg/l as N

Final Temperature (FT) = $10^{(0.03)(20-T)}$
Final Temperature (FT) = 0.723

Final pH (FPH) = 1; where 8.0<pH<9.0
or = $(1+10^{(7.4-pH)})/1.25$; where 6.5<pH<8.0
Final pH (FPH) = 1.118

Ratio = 13.5; where 7.7<pH<9.0
or = $[(20.25)(10^{(7.7-pH)})]/(1+10^{(7.4-pH)})$; where 6.5<pH<7.7
Ratio = 13.500

Calculated Unionized Ammonia = ((0.8/FT)/FPH)/Ratio
Calculated Unionized Ammonia = 0.0733

pKa = 0.09018 + (2729.92/(273.2 + Temp.))
pKa = 9.254
Fraction of Unionized Ammonia = $1/(10^{(pKa-pH)}+1)$
Fraction of Unionized Ammonia = 0.0340

Total Acute Ammonia Criteria = 2.159
Total Acute Ammonia Criteria = 1.78

Parameters	Instream Background	Acute Criteria (mg/l)	Acute Baseline (mg/l)	Acute WLA (mg/l)	Antideg Acute WLA (mg/l)	SSTV = 0.4 X aWLA (mg/l)	Chronic Criteria (mg/l)	Chronic Baseline (mg/l)	Chronic WLA (mg/l)	Antideg Chronic WLA (mg/l)	SSTV = 0.6 X cWLA (mg/l)
Ammonia	ND	7.80	1.95	59.24	140.67	23.70	1.78	0.44	151.19	37.80	22.68

Notes:
1) ND = No Data available, and therefore the background concentrations are assumed to be Zero.
2) Total Ammonia Criteria (Acute & Chronic) = Calculated un-ionized ammonia criteria divided by fraction of un-ioized Ammonia
3) Total Ammonia is then converted to Ammonia-Nitrogen by multiplingTotal Ammonia by 0.824
4) In the pKa calculation the temperature is ^{0}C.
5) Acute criteria/WLA based on 1Q10 flow; chronic criteria/WLA based on 7Q10 flow.

Mixing Zone Predictions for Fauquier Springs High flow

Effluent Flow = 0.02 MGD
Stream 7Q10 = 20.0 MGD
Stream 30Q10 = 30.4 MGD
Stream 1Q10 = 16.2 MGD
Stream slope = .006 ft/ft
Stream width = 50 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .7376 ft
Length = 3017.69 ft
Velocity = .8402 ft/sec
Residence Time = .0416 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .9513 ft
Length = 2427.33 ft
Velocity = .99 ft/sec
Residence Time = .0284 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .6493 ft
Length = 3363.23 ft
Velocity = .7734 ft/sec
Residence Time = 1.2079 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 82.79% of the 1Q10 is used.

Mixing Zone Predictions for Fauquier Springs CC STP

Effluent Flow = 0.02 MGD
Stream 7Q10 = 1.68 MGD
Stream 30Q10 = 3.6 MGD
Stream 1Q10 = 1.422 MGD
Stream slope = 0.006 ft/ft
Stream width = 50 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .1665 ft
Length = 10589.3 ft
Velocity = .3161 ft/sec
Residence Time = .3877 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .2624 ft
Length = 7228.07 ft
Velocity = .4271 ft/sec
Residence Time = .1959 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .1508 ft
Length = 11502.92 ft
Velocity = .2961 ft/sec
Residence Time = 10.7926 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 9.27% of the 1Q10 is used.

3-RPP147.10 pH and Temp Data from 1993 to 2003

COUNT	DATE	pH	pH-Sort	DATE	TEMP C	Temp-Sort
1	5/29/2003	7.1	6.4	5/29/2003	15.4	0.1
2	2/11/2003	7.3	6.4	2/11/2003	1.5	0.5
3	1/30/2003	7.3	6.5	1/30/2003	0.1	1.0
4	6/6/2001	6.9	6.5	6/6/2001	25.8	1.3
5	5/1/2001	7.5	6.5	5/1/2001	16.5	1.5
6	4/3/2001	7.3	6.5	4/3/2001	8.5	2.4
7	11/1/2000	6.5	6.6	11/1/2000	11.4	3.0
8	10/3/2000	7.1	6.8	10/3/2000	17.1	3.0
9	9/13/2000	6.9	6.8	9/13/2000	22.1	3.1
10	8/8/2000	7.1	6.8	8/8/2000	24.7	3.2
11	7/12/2000	7.1	6.8	7/12/2000	23.0	3.3
12	6/13/2000	7.0	6.8	6/13/2000	22.3	3.8
13	5/4/2000	7.0	6.8	5/4/2000	19.5	3.8
14	4/12/2000	7.4	6.8	4/12/2000	15.2	3.8
15	3/23/2000	6.4	6.8	3/23/2000	10.8	3.9
16	2/10/2000	7.7	6.9	2/10/2000	1.3	3.9
17	1/12/2000	6.5	6.9	1/12/2000	4.8	4.5
18	12/13/1999	7.5	6.9	12/13/1999	4.5	4.8
19	10/6/1999	7.2	6.9	10/6/1999	14.2	5.0
20	9/8/1999	6.9	6.9	9/8/1999	22.8	5.8
21	8/17/1999	7.4	7.0	8/17/1999	28.8	6.0
22	7/20/1999	7.3	7.0	7/20/1999	27.0	6.7
23	6/22/1999	7.4	7.0	6/22/1999	21.9	7.0
24	5/13/1999	6.8	7.0	5/13/1999	19.8	7.1
25	3/16/1999	7.0	7.0	3/16/1999	3.8	7.3
26	1/13/1999	6.8	7.0	1/13/1999	1.0	7.6
27	12/16/1998	7.4	7.0	12/16/1998	3.8	7.7
28	11/18/1998	7.0	7.0	11/18/1998	8.0	7.9
29	10/22/1998	7.0	7.1	10/22/1998	11.4	8.0
30	9/16/1998	7.0	7.1	9/16/1998	24.7	8.5
31	8/19/1998	7.8	7.1	8/19/1998	23.6	9.8
32	7/21/1998	7.8	7.1	7/21/1998	26.3	10.2
33	6/25/1998	7.6	7.1	6/25/1998	24.1	10.4
34	5/12/1998	7.9	7.1	5/12/1998	14.7	10.8
35	4/29/1998	7.5	7.1	4/29/1998	14.3	11.4
36	4/9/1998	7.9	7.2	4/9/1998	13.8	11.4
37	3/18/1998	7.5	7.2	3/18/1998	5.8	11.5
38	2/26/1998	7.3	7.2	2/26/1998	7.9	11.6
39	1/21/1998	6.6	7.2	1/21/1998	3.3	13.0
40	12/17/1997	7.6	7.2	12/17/1997	3.2	13.4
41	11/18/1997	7.5	7.2	11/18/1997	3.9	13.4
42	10/8/1997	7.3	7.2	10/8/1997	19.2	13.7
43	9/10/1997	7.5	7.3	9/10/1997	21.2	13.8
44	8/28/1997	7.5	7.3	8/28/1997	23.4	14.2
45	7/24/1997	7.6	7.3	7/24/1997	21.6	14.3
46	5/22/1997	7.1	7.3	5/22/1997	17.2	14.7
47	4/23/1997	7.2	7.3	4/23/1997	11.5	15.2
48	3/26/1997	7.1	7.3	3/26/1997	10.2	15.4
49	2/20/1997	7.6	7.3	2/20/1997	9.8	16.1
50	1/29/1997	7.0	7.3	1/29/1997	3.0	16.4
51	12/18/1996	7.3	7.3	12/18/1996	7.7	16.5

~~Exh2~~

Pg 5 of 6

52	11/20/1996	7.5	7.3	11/20/1996	7.6	17.1
53	9/26/1996	7.7	7.3	9/26/1996	16.4	17.2
54	8/27/1996	7.8	7.3	8/27/1996	23.6	18.2
55	7/24/1996	7.3	7.3	7/24/1996	23.4	18.3
56	6/27/1996	8.0	7.3	6/27/1996	22.8	19.2
57	6/21/1996	7.2	7.3	6/21/1996	24.1	19.5
58	5/21/1996	7.3	7.4	5/21/1996	23.5	19.8
59	4/15/1996	6.5	7.4	4/15/1996	13.7	20.5
60	3/21/1996	6.4	7.4	3/21/1996	6.7	21.2
61	2/22/1996	6.5	7.4	2/22/1996	7.0	21.4
62	11/8/1995	7.6	7.4	11/8/1995	7.3	21.6
63	8/23/1995	7.6	7.4	8/23/1995	24.1	21.9
64	7/20/1995	7.2	7.5	7/20/1995	25.5	22.1
65	6/21/1995	7.2	7.5	6/21/1995	24.0	22.3
66	5/24/1995	7.2	7.5	5/24/1995	21.4	22.8
67	4/26/1995	7.0	7.5	4/26/1995	13.4	22.8
68	3/23/1995	7.7	7.5	3/23/1995	10.4	23.0
69	2/14/1995	7.8	7.5	2/14/1995	0.5	23.1
70	1/25/1995	7.4	7.5	1/25/1995	3.0	23.4
71	12/20/1994	7.6	7.5	12/20/1994	3.8	23.4
72	10/18/1994	6.8	7.6	10/18/1994	11.6	23.5
73	9/8/1994	7.8	7.6	9/8/1994	18.2	23.6
74	8/11/1994	7.4	7.6	8/11/1994	25.7	23.6
75	7/19/1994	7.3	7.6	7/19/1994	23.9	23.6
76	6/2/1994	7.2	7.6	6/2/1994	20.5	23.8
77	5/12/1994	6.9	7.6	5/12/1994	16.1	23.9
78	3/17/1994	6.9	7.6	3/17/1994	5.0	24.0
79	2/17/1994	6.8	7.6	2/17/1994	2.4	24.1
80	11/22/1993	7.6	7.7	11/22/1993	6.0	24.1
81	10/7/1993	7.3	7.7	10/7/1993	13.4	24.1
82	9/7/1993	7.3	7.7	9/7/1993	23.6	24.7
83	8/12/1993	7.3	7.8	8/12/1993	23.8	24.7
84	7/15/1993	7.3	7.8	7/15/1993	26.7	25.5
85	6/17/1993	6.8	7.8	6/17/1993	23.1	25.7
86	5/17/1993	6.8	7.8	5/17/1993	18.3	25.8
87	4/19/1993	7.3	7.8	4/19/1993	13.0	26.3
88	3/22/1993	7.1	7.9	3/22/1993	7.1	26.7
89	2/23/1993	6.8	7.9	2/23/1993	3.9	27.0
90	1/26/1993	6.8	8.0	1/26/1993	3.1	28.8

The regional modeling system has been used to 1) verify the adequacy of the current permit limits for the reissuance of Fauquier Springs Country Club and 2) to verify that antidegradation , a D.O. drop of not more than 0.2 mg/l, would not occur.

The model has been run from the discharge point of the proposed River Ridge Utility Company STP upstream of the Fauquier Springs Country Club STP to a point 3 miles downstream of the Fauquier Springs Country Club STP. The permit limits for the River Ridge Utility Company STP and the proposed South Wales STP were used to simulate background conditions for the river, once these facilities are constructed.

The TKN limit for Fauquier Springs Country Club STP was derived by doubling the facility's current ammonia as nitrogen limit of 15.4 mg/l, since the assumption is made that TKN is equal to twice the ammonia as nitrogen value.

****

REGIONAL MODELING SYSTEM VERSION 3.2

****

MODEL SIMULATION FOR THE River Ridge Utility Company STP DISCHARGE

TO Rappahannock River

THE SIMULATION STARTS AT THE River Ridge Utility Company STP DISCHARGE

********** PROPOSED PERMIT LIMITS **********

FLOW = .05 MGD cBOD5 = 9 Mg/L TKN = 3 Mg/L D.O. = 5 Mg/L

**** THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0.367 Mg/L ****

THE SECTION BEING MODELED IS BROKEN INTO 3 SEGMENTS
RESULTS WILL BE GIVEN AT 0.1 MILE INTERVALS

********** BACKGROUND CONDITIONS **********

THE 7Q10 STREAM FLOW AT THE DISCHARGE IS 1.62000 MGD
THE DISSOLVED OXYGEN OF THE STREAM IS 7.296 Mg/L
THE BACKGROUND cBODu OF THE STREAM IS 5 Mg/L
THE BACKGROUND nBOD OF THE STREAM IS 0 Mg/L

********** MODEL PARAMETERS **********

SEG.	LEN. Mi	VEL. F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV. Ft	TEMP. ½C	DO-SAT Mg/L
1	2.10	0.816	8.571	0.500	0.150	0.000	335.00	26.00	8.106
2	1.90	0.753	6.316	0.500	0.150	0.000	310.00	26.00	8.113
3	3.00	0.522	3.000	0.500	0.150	0.000	292.50	26.00	8.118

(The K Rates shown are at 20½C ... the model corrects them for temperature.)

********** RESPONSE FOR SEGMENT 1 **********

TOTAL STREAMFLOW = 1.6700 MGD
(Including Discharge)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	0.000	7.227	5.524	0.000
0.100	0.100	7.263	5.497	0.000
0.200	0.200	7.296	5.470	0.000
0.300	0.300	7.296	5.443	0.000
0.400	0.400	7.296	5.416	0.000
0.500	0.500	7.296	5.390	0.000
0.600	0.600	7.296	5.363	0.000
0.700	0.700	7.296	5.337	0.000
0.800	0.800	7.296	5.310	0.000
0.900	0.900	7.296	5.284	0.000
1.000	1.000	7.296	5.258	0.000
1.100	1.100	7.296	5.232	0.000
1.200	1.200	7.296	5.207	0.000
1.300	1.300	7.296	5.181	0.000
1.400	1.400	7.296	5.155	0.000
1.500	1.500	7.296	5.130	0.000
1.600	1.600	7.296	5.105	0.000
1.700	1.700	7.296	5.080	0.000
1.800	1.800	7.296	5.055	0.000
1.900	1.900	7.296	5.030	0.000
2.000	2.000	7.296	5.005	0.000
2.100	2.100	7.296	5.000	0.000

FOR THE DISCHARGE AT THE END OF SEGMENT 1
DISCHARGER = South Wales STP (Proposed Facility)
FLOW = .8568 MGD cBOD5 = 3 Mg/L TKN = 3 Mg/L D.O. = 7.6 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0.0768 MGD

********** RESPONSE FOR SEGMENT 2 **********

TOTAL STREAMFLOW = 2.6036 MGD
(Including Discharge, Tributaries and Incremental D.A. Flow)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	2.100	7.396	5.823	0.000
0.100	2.200	7.302	5.792	0.000
0.200	2.300	7.302	5.761	0.000
0.300	2.400	7.302	5.730	0.000
0.400	2.500	7.302	5.700	0.000
0.500	2.600	7.302	5.669	0.000
0.600	2.700	7.302	5.639	0.000
0.700	2.800	7.302	5.609	0.000
0.800	2.900	7.302	5.579	0.000
0.900	3.000	7.302	5.549	0.000
1.000	3.100	7.302	5.520	0.000
1.100	3.200	7.302	5.490	0.000
1.200	3.300	7.302	5.461	0.000
1.300	3.400	7.302	5.432	0.000
1.400	3.500	7.302	5.403	0.000
1.500	3.600	7.302	5.374	0.000
1.600	3.700	7.302	5.345	0.000
1.700	3.800	7.302	5.317	0.000
1.800	3.900	7.302	5.289	0.000
1.900	4.000	7.302	5.260	0.000

FOR THE DISCHARGE AT THE END OF SEGMENT 2
DISCHARGER = Fauquier Springs Country Club STP
FLOW = .02 MGD cBOD5 = 30 Mg/L TKN = 30.8 Mg/L D.O. = 6 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0.0121 MGD

********** RESPONSE FOR SEGMENT 3 **********

TOTAL STREAMFLOW = 2.6357 MGD
(Including Discharge, Tributaries and Incremental D.A. Flow)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	4.000	7.292	5.788	0.913
0.100	4.100	7.279	5.744	0.911
0.200	4.200	7.266	5.700	0.908
0.300	4.300	7.255	5.656	0.906
0.400	4.400	7.244	5.613	0.903
0.500	4.500	7.234	5.570	0.901
0.600	4.600	7.225	5.527	0.898
0.700	4.700	7.216	5.484	0.896
0.800	4.800	7.208	5.442	0.893
0.900	4.900	7.201	5.401	0.891
1.000	5.000	7.194	5.359	0.888
1.100	5.100	7.188	5.318	0.886
1.200	5.200	7.183	5.277	0.883
1.300	5.300	7.178	5.237	0.881
1.400	5.400	7.173	5.196	0.878
1.500	5.500	7.169	5.157	0.876
1.600	5.600	7.166	5.117	0.874
1.700	5.700	7.163	5.078	0.871
1.800	5.800	7.160	5.039	0.869
1.900	5.900	7.158	5.000	0.867
2.000	6.000	7.193	5.000	0.864
2.100	6.100	7.228	5.000	0.862
2.200	6.200	7.261	5.000	0.859
2.300	6.300	7.292	5.000	0.857
2.400	6.400	7.307	5.000	0.854
2.500	6.500	7.307	5.000	0.852
2.600	6.600	7.307	5.000	0.850
2.700	6.700	7.307	5.000	0.847
2.800	6.800	7.307	5.000	0.845
2.900	6.900	7.307	5.000	0.843
3.000	7.000	7.307	5.000	0.840

****

REGIONAL MODELING SYSTEM Ver 3.2 (OWRM - 9/90)
07-20-1998 08:59:59

DATA FILE = FAQSP1.MOD

****

REGIONAL MODELING SYSTEM VERSION 3.2

DATA FILE SUMMARY

****

THE NAME OF THE DATA FILE IS: FAQSP1.MOD

THE STREAM NAME IS: Rappahannock River
THE RIVER BASIN IS: Rappahannock River
THE SECTION NUMBER IS: 3
THE CLASSIFICATION IS: III

STANDARDS VIOLATED (Y/N) = N
STANDARDS APPROPRIATE (Y/N) = Y

DISCHARGE WITHIN 3 MILES (Y/N) = N

THE DISCHARGE BEING MODELED IS: River Ridge Utility Company STP

PROPOSED LIMITS ARE:
FLOW = .05 MGD
BOD5 = 9 MG/L
TKN = 3 MG/L
D.O. = 5 MG/L

THE NUMBER OF SEGMENTS TO BE MODELED = 3

7Q10 WILL BE CALCULATED BY: DRAINAGE AREA COMPARISON
THE GAUGE NAME IS: Rappahannock River near Warrenton
GAUGE DRAINAGE AREA = 195 SQ.MI.
GAUGE 7Q10 = 1.62 MGD
DRAINAGE AREA AT DISCHARGE = 195 SQ.MI.

STREAM A DRY DITCH AT DISCHARGE (Y/N) = N
ANTIDEGRADATION APPLIES (Y/N) = Y

ALLOCATION DESIGN TEMPERATURE = 26 ½C

SEGMENT INFORMATION

####### SEGMENT # 1 #######

SEGMENT ENDS BECAUSE: A DISCHARGE ENTERS AT END

SEGMENT LENGTH = 2.1 MI

SEGMENT WIDTH = 8 FT
SEGMENT DEPTH = 1 FT
SEGMENT VELOCITY = .3 FT/SEC

DRAINAGE AREA AT SEGMENT START = 195 SQ.MI.
DRAINAGE AREA AT SEGMENT END = 204.24 SQ.MI.

ELEVATION AT UPSTREAM END = 350 FT
ELEVATION AT DOWNSTREAM END = 320 FT

THE CROSS SECTION IS: RECTANGULAR
THE CHANNEL IS: MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = N

THE BOTTOM TYPE = SAND
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = NONE
WATER COLORED GREEN (Y/N) = N

THE DISCHARGE AT THE SEGMENT END IS: South Wales STP (Proposed Facility)

ITS CONCENTRATIONS ARE:
FLOW = .8568 MGD
BOD5 = 3 MG/L
TKN = 3 MG/L
D.O. = 7.6 MG/L

SEGMENT INFORMATION

####### SEGMENT # 2 #######

SEGMENT ENDS BECAUSE: A DISCHARGE ENTERS AT END

SEGMENT LENGTH = 1.9 MI

SEGMENT WIDTH = 13 FT
SEGMENT DEPTH = 1 FT
SEGMENT VELOCITY = .3 FT/SEC

DRAINAGE AREA AT SEGMENT START = 204.24 SQ.MI.
DRAINAGE AREA AT SEGMENT END = 205.7 SQ.MI.

ELEVATION AT UPSTREAM END = 320 FT
ELEVATION AT DOWNSTREAM END = 300 FT

THE CROSS SECTION IS: RECTANGULAR
THE CHANNEL IS: MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = N

THE BOTTOM TYPE = SAND
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = NONE
WATER COLORED GREEN (Y/N) = N

THE DISCHARGE AT THE SEGMENT END IS: Fauquier Springs Country Club STP

ITS CONCENTRATIONS ARE:
FLOW = .02 MGD
BOD5 = 30 MG/L
TKN = 30.8 MG/L
D.O. = 6 MG/L

SEGMENT INFORMATION

####### SEGMENT # 3 #######

SEGMENT ENDS BECAUSE: THE MODEL ENDS

SEGMENT LENGTH = 3 MI

SEGMENT WIDTH = 18 FT
SEGMENT DEPTH = .8 FT
SEGMENT VELOCITY = .3 FT/SEC

DRAINAGE AREA AT SEGMENT START = 205.7 SQ.MI.
DRAINAGE AREA AT SEGMENT END = 208 SQ.MI.

ELEVATION AT UPSTREAM END = 300 FT
ELEVATION AT DOWNSTREAM END = 285 FT

THE CROSS SECTION IS: RECTANGULAR
THE CHANNEL IS: MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = N

THE BOTTOM TYPE = SAND
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = NONE
WATER COLORED GREEN (Y/N) = N

****

State Water Control Board
2111 North Hamilton Street P. O. Box 11143 Richmond, VA. 23230

SUBJECT: Stream Analysis - Fauquier Springs Country Club

TO: Ernie Watkins - NRO

FROM: Martin G. Ferguson, Jr.

DATE: February 10, 1988

COPIES: Burt Tuxford, Steve Crowther - NRO

We have reviewed the stream analysis for the Fauquier Springs Country Club discharge to the Rappahannock River submitted on January 26, 1988.

The model is approved for use and we have no problem with the permit limits determined.

brt24/sph

State Water Control Board
2111 North Hamilton Street P. O. Box 11143 Richmond, VA. 23230

SUBJECT: Stream Analysis for Fauquier Springs Country Club

TO: Martin Ferguson, Jr. - OWRM

FROM: Steve Crowther - NRO

DATE: January 26, 1988

Please find attached a stream analysis for OWRM review and comment.

Attachment

MEMORANDUM

State Water Control Board
2111 North Hamilton Street P. O. Box 11143 Richmond, VA. 23230

SUBJECT: Stream Analysis for Fauquier Springs Country Club

TO: Dale Phillips, OWRM

FROM: Steve Crowther, NRC

DATE: January 26, 1988

An NPDES permit application has been received for discharge of effluent from the Fauquier Springs Country Club lagoon directly to the Rappahannock River. The lagoon design flow is 17,430 GPD based on a 25 day detention time. This facility has been in existence for more than twenty years.

The Q7-10 for the Rappahannock River at the discharge point is approximately 1.58 MGD, the slope is 5 ft/mile, and the elevation is 300 feet. A velocity of 0.25 ft/sec has been assumed. Some background BOD_5 data for the Rappahannock River was obtained from the Remington (12-10-87) model.

Attached are four model simulations. The STP discharge data was first assumed as BOD_5 = 30 mg/l, TKN = 18 mg/l, and DO = 6.5 mg/l. K2 is 3.0 day^{-1} and K1 and Kn are 0.11 day^{-1}. The first simulation was run with good results. In the second simulation, the DO was dropped to 6.0 mg/l. In the third, the K2 value was halved, K1 and Kn doubled, with DO = 6.0. In the fourth run, the TKN discharge value was increased to 24 mg/l with K2 halved, K1 and Kn doubled, and DO = 6.0 mg/l. All of the simulations gave good results with a maximum deficit $\approx$ .17 mg/l.

Because the lagoon has a 25 day detention time, I expect that warm weather TKN effluent values will be low even though I incorporated a TKN value of 21 mg/l into the model. Since the model results will protect the river from degradation, it appears TKN does not need to be a permit parameter at this time.

Therefore, the proposed permit limits are:

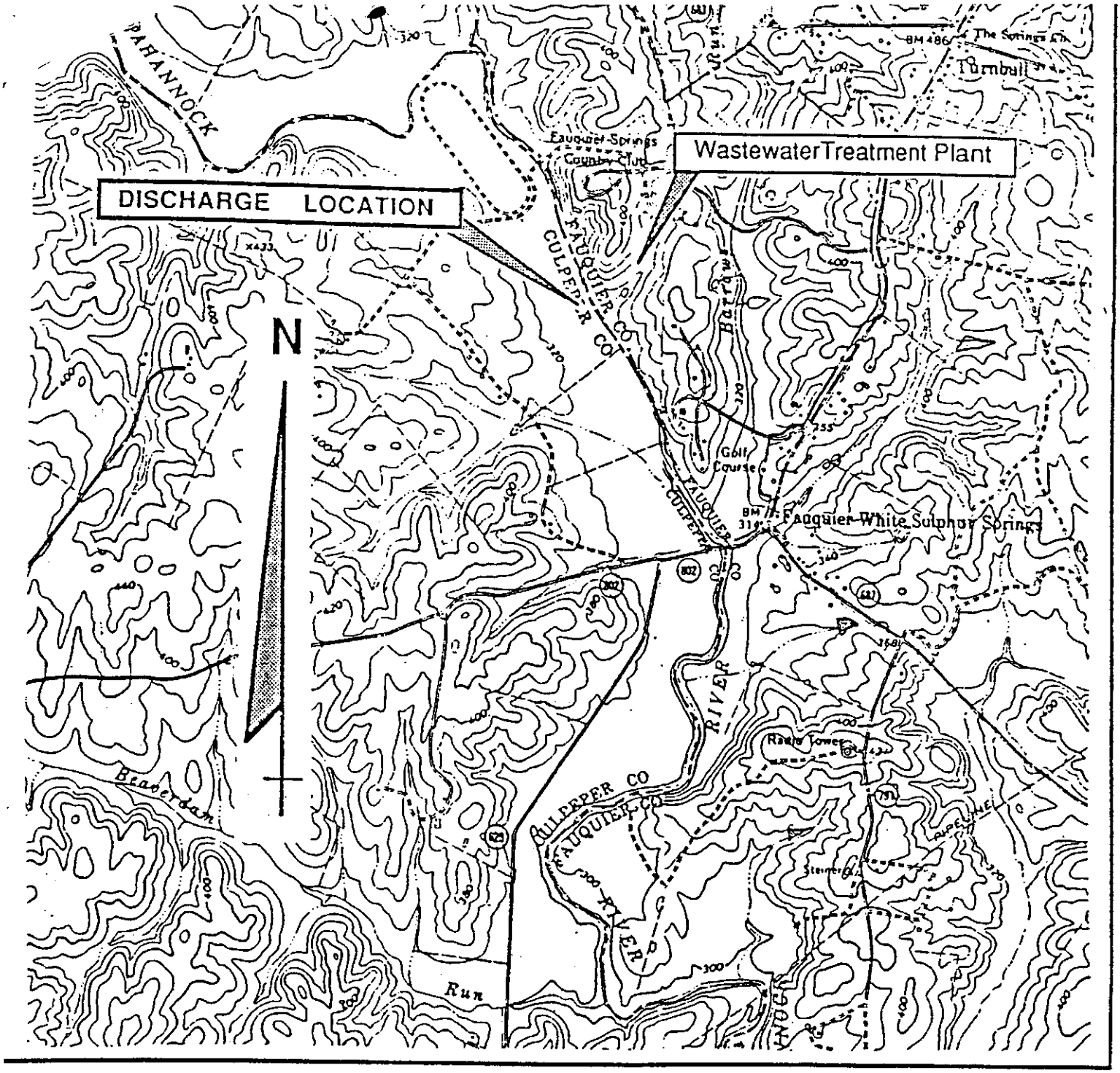
BOD_5 = 30 mg/l
TSS = 30 mg/l
DO = 6.0 mg/l

Attachment

Remington STP Model

BACKGROUND STREAM DATA FOR BOD_5
RAPPAHANNOCK RIVER AT REMINGTON

DATE	BOD (mg/l)
1/84	2
2/84	2
3/84	1
4/84	2
5/84	1
7/84	1
8/84	3
9/84	1
10/84	1
11/84	1
12/84	3
1/85	1
3/85	1
4/85	1
6/85	1
7/85	1
2/86	1
3/86	1
4/86	1
5/86	1
6/86	2
7/86	1
8/86	4
TOTAL	34
AVERAGE	1.5



From U. S. G. S. "Warrenton" and "Jeffersonton" Quadrangles

(Fauquier Springs Country Club)

Location Map

SULPHUR SPRINGS INVESTMENT CORPORATION
WASTEWATER TREATMENT FACILITY

Scale 1" = 2000'

gilbert w. clifford & associates

OCTOBER, 1987

(1)

MODEL SIMULATION FOR THE FAUQUIER SPRINGS COUNTRY CLUB DISCHARGE TO RAPPAHANNOCK RIVER

THE BACKGROUND CONDITIONS ARE:

FLOW= 1.5800 MGD D.O.= 6.875 MG/L CBODu= 3.75 MG/L NBODu= 0.87 MG/L

OUTPUT WILL BE GENERATED EVERY 0.20 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 3.00 MI VELOCITY = 4.091 MI/D
TEMP. = 30.0 °C ELEV = 300.00 FT SATURATION D.O. = 7.639 MG/L
Ka = 3.000 /DAY Kr = 0.110 /DAY Kn = 0.110 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0174 MGD D.O.= 6.50 MG/L CBODu= 75.00 MG/L NBODu= 65.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.871	4.527	1.570
0.200	0.200	6.950	4.489	1.552
0.400	0.400	7.016	4.451	1.534
0.600	0.600	7.071	4.413	1.516
0.800	0.800	7.117	4.376	1.499
1.000	1.000	7.156	4.339	1.481
1.200	1.200	7.189	4.302	1.464
1.400	1.400	7.216	4.266	1.447
1.600	1.600	7.240	4.229	1.431
1.800	1.800	7.260	4.194	1.414
2.000	2.000	7.277	4.158	1.398
2.200	2.200	7.291	4.123	1.382
2.400	2.400	7.304	4.088	1.366
2.600	2.600	7.315	4.053	1.350
2.800	2.800	7.324	4.019	1.334
3.000	3.000	7.332	3.985	1.319

STP:
cBOD = 30
TKN = 18-3.15
DO = 6.5

Reach = 3.0 mile, velocity = .25 ft/sec, elevation = 300 ft, slope = 5 ft/mi.

$K_2 = (.125)(24)(5\ ft/mi) = 3\ day^{-1}$

MODEL SIMULATION FOR THE FAUQUIER SPRINGS COUNTRY CLUB DISCHARGE TO RAPPAHANNOCK RIVER

THE BACKGROUND CONDITIONS ARE:

FLOW= 1.5800 MGD D.O.= 6.875 MG/L CBODu= 3.75 MG/L NBODu= 0.87 MG/L

OUTPUT WILL BE GENERATED EVERY 0.20 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 3.00 MI VELOCITY = 4.091 MI/D
TEMP. = 30.0 °C ELEV = 300.00 FT SATURATION D.O. = 7.639 MG/L
Ka = 3.000 /DAY Kr = 0.110 /DAY Kn = 0.110 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0174 MGD D.O.= 6.00 MG/L CBODu= 75.00 MG/L NBODu= 65.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.865	4.527	1.570
0.200	0.200	6.945	4.489	1.552
0.400	0.400	7.012	4.451	1.534
0.600	0.600	7.068	4.413	1.516
0.800	0.800	7.114	4.376	1.499
1.000	1.000	7.154	4.339	1.481
1.200	1.200	7.187	4.302	1.464
1.400	1.400	7.215	4.266	1.447
1.600	1.600	7.239	4.229	1.431
1.800	1.800	7.259	4.194	1.414
2.000	2.000	7.276	4.158	1.398
2.200	2.200	7.291	4.123	1.382
2.400	2.400	7.303	4.088	1.366
2.600	2.600	7.314	4.053	1.350
2.800	2.800	7.324	4.019	1.334
3.000	3.000	7.332	3.985	1.319

(4)

In this simulation the STP DO has been reduced to 6.0 mg/L.

SIMULATION COMPLETED

MODEL SIMULATION FOR THE FAUQUIER SPRINGS COUNTRY CLUB DISCHARGE TO RAPPAHANNOCK RIVER

THE BACKGROUND CONDITIONS ARE:

FLOW= 1.5800 MGD D.O.= 6.875 MG/L CBODu= 3.75 MG/L NBODu= 0.87 MG/L

OUTPUT WILL BE GENERATED EVERY 0.20 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 3.00 MI VELOCITY = 4.091 MI/D
TEMP. = 30.0 °C ELEV = 300.00 FT SATURATION D.O. = 7.639 MG/L
Ka = 1.500 /DAY Kr = 0.220 /DAY Kn = 0.220 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0174 MGD D.O.= 6.00 MG/L CBODu= 75.00 MG/L NBODu= 65.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.865	4.527	1.570
0.200	0.200	6.827	4.451	1.534
0.400	0.400	6.794	4.376	1.499
0.600	0.600	6.765	4.302	1.464
0.800	0.800	6.741	4.229	1.431
1.000	1.000	6.722	4.158	1.398
1.200	1.200	6.705	4.088	1.366
1.400	1.400	6.692	4.019	1.334
1.600	1.600	6.682	3.951	1.304
1.800	1.800	6.675	3.884	1.274
2.000	2.000	6.670	3.819	1.244
2.200	2.200	6.667	3.754	1.216
2.400	2.400	6.666 SAG	3.691	1.188
2.600	2.600	6.667	3.629	1.161
2.800	2.800	6.670	3.567	1.134
3.000	3.000	6.673	3.507	1.108

(3)

cBOD = 30
TKN = 18-3 = 15
DO = 6

& the sensitivity run, Ka has been halved and Kr and Kn doubled.

STREAM SIMULATION for the FAUQUIER SPRINGS COUNTRY CLUB DISCHARGE TO RAPPAHANNOCK RIVER

THE BACKGROUND CONDITIONS ARE:

FLOW= 1.5800 MGD D.O.= 6.875 MG/L CBODu= 3.75 MG/L NBODu= 0.87 MG/L

OUTPUT WILL BE GENERATED EVERY 0.20 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 3.00 MI VELOCITY = 4.091 MI/D
TEMP. = 30.0 °C ELEV = 300.00 FT SATURATION D.O. = 7.639 MG/L
Ka = 1.500 /DAY Kr = 0.220 /DAY Kn = 0.220 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0174 MGD D.O.= 6.00 MG/L CBODu= 75.00 MG/L NBODu= 91.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.865	4.527	1.853
0.200	0.200	6.821	4.451	1.811
0.400	0.400	6.782	4.376	1.769
0.600	0.600	6.749	4.302	1.729
0.800	0.600	6.720	4.229	1.689
1.000	1.000	6.697	4.158	1.650
1.200	1.200	6.677	4.088	1.612
1.400	1.400	6.661	4.019	1.575
1.600	1.600	6.649	3.951	1.539
1.800	1.800	6.639	3.884	1.504
2.000	2.000	6.632	3.819	1.469
2.200	2.200	6.628	3.754	1.436
2.400	2.400	6.626 DO	3.691	1.403
2.600	2.600	6.626	3.629	1.370
2.800	2.800	6.627	3.567	1.339
3.000	3.000	6.630	3.507	1.308

cBOD = 30
TKN = 24-3=21 mg/L
DO = 6.0

In this simulation, the NBOD has been increased from 65 mg/L to 91.00 mg/L. The result appears to be relatively insensitive to the change.

Conclusion: The proposed permit limits are:

cBOD$_5$ = 30
TKN = No permit limit necessary
DO = 6.0 mg/L

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Fauquier County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2014 to XXX, 2014

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Sulphur Springs Investment Corporation, P. O. Box 419, Warrenton, VA 20186, VA0077411

PROJECT DESCRIPTION: Sulphur Springs Investment Corporation has applied for a reissuance of a permit for the private Fauquier Springs Country Club WWTP. The applicant proposes to release treated sewage wastewaters from private country club and golf course at a rate up to 0.02 million gallons per day into a water body. The sludge will be disposed by transporting it to Fauquier County Water and Sanitation Authority's Remington Regional Wastewater Treatment Plant (VA0076805) for processing and disposal. The facility proposes to release treated sewage in the Rappahannock River in Fauquier County in the Rappahannock River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, BOD_5, Total Suspended Solids, Dissolved Oxygen, Ammonia as N, and *E. coli* bacteria.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Joan C. Crowther
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3925 E-mail: joan.crowther@deq.virginia.gov Fax: (703) 583-3821